RPS Energy

February 23rd, 2012

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RE: **TGS/PGS/MKI North Eastern Canada 2D Seismic Exploration Survey**
File OF-EP-GeoOp-M711-5554587 02
CEAR File #: 10-01-53884

1. **Preamble**: The National Energy Board has received letters of comment from the following organization or individuals;

   i. Environment Canada (EC), dated 28 May 2010;
   ii. Baffin Fisheries Coalition, dated 1 June 2011
   iii. Arctic Fisheries Alliance, dated 9 June 2011;
   iv. Government of Nunavut, dated 10 June 2011;
   v. Qikiqtani Inuit Association, dated 13 June 2011;
   vi. Shari Gearheard, dated 31 May 2011

   Request: Please respond to the comments. If applicable, include in your response justification for not implementing recommendations made in the comments.

MKI Response: Environment Canada

Comment: *Request for Information*

- *Ballast Water Management Plan*
- *Waste Management Plan*
- *Survey Acquisition Plan*
- *Spill Contingency Plan*

MKI Response:

MKI, as requested, provides the following plans for the vessel Sanco Spirit:

Appendix 1 – Ballast Water Management Plan
Appendix 2 – Waste Management Plan
Appendix 3 – Ship Oil Pollution Emergency Plan (SOPEP)
Appendix 4 - SOPEP Approval
Appendix 5 - Vessel Sanco Spirit

The M/V Sanco Spirit was inspected by DNV in April of 2011 for the issuance of an Arctic Pollution Prevention Certificate and a gap analysis was conducted. The vessel will be certified for and issued with an Arctic Pollution Prevention Certificate, prior to the start of work in Baffin Bay. All plans and contingencies will be adjusted as a part of this approval as necessary.

The Survey Acquisition Plan is ongoing as we continue to consult within the communities and can be provided prior to the start of the program.

With regards to Spill Contingency Plan, the vessel is classed with DNV and has an approved SOPEP onboard. As mentioned earlier, SOPEP stands for Ship Oil Pollution Emergency Plan and, as per the MARPOL 73/78 requirement under Annex I, all ships with 400 GT and above must carry an oil prevention plan as per the norms and guidelines laid down by International Maritime Organization under the Marine Environmental Protection Committee (MEPC) act. As mentioned above, Appendix 3 & 4 – SOPEP Plan and SOPEP Approval from DNV.

Comment: *How the proponent will refuel?*

MKI Response: The proponent will not be refueling at sea.

Comment: *Without vessel information there is a lack of understanding*

MKI Response: The vessel is the M/V Sanco Spirit as discussed in the EA Report. Attached Appendix 5 – Vessel Specifications.

Comment: *Water Quality – Fisheries Act Section 36(3)*
All mitigation measures identified by the proponent, and the additional measures suggested herein, should be strictly adhered to during project activities. This will require awareness on the part of the proponents' representatives (including contractors) during operations in the field. EC recommends that all field operations staff be made aware of the proponents' commitments to these mitigation measures and provided with appropriate advice/training on how to implement these measures. Meeting the requirements of the Fisheries Act is mandatory, irrespective of any other regulatory or permitting system.

MKI Response: See response to Government of Nunavut- Dept of Executive & Intergovernmental Affairs (pp. 26 & 27) and National Energy Board (p. 33).

Comment: *Waste Treatment and Disposal. Waste Treatment and Disposal*
EC recommends that the proponent indicate how and where they will dispose of bilge water.

EC recommends that the proponent makes every possible effort to ensure compliance with the MARPOL Annex V convention. This convention states that bio-degradable food scraps up to one inch in diameter may be discharged over the side (e.g., of the vessel), but not within 12 nautical miles of any chartered reef or coastline.

Every possible reasonable effort must be taken to meet the requirements of the applicable legislation/regulations for the disposal of bilge and ballast water.

For sewage/grey water treatment, EC recommends that any and all treatment be appropriately designed to meet applicable criteria and to meet the requirements of legislation/regulations. Furthermore, EC recommends that any discharge be suitable for discharge under the requirements of applicable legislation and requirements.

All non-combustible solid wastes (e.g., potable water bottles) shall be disposed of at an appropriate facility. The proponent is encouraged to make use of recycling facilities for all recyclable materials.

MKI Response: See response to National Energy Board (p. 33) and Appendix 2 – Waste Management Plan.

Comment: *Wildlife and Species at Risk*
Species at Risk that could be encountered or affected by the project should be identified and any potential adverse effects of the project to the species, its habitat, and/or its residence noted. All direct, indirect, and cumulative effects should be considered. Refer to species status reports and other information on the Species at Risk registry at www.sararegistry.gc.ca for information on specific species.

If Species at Risk are encountered or affected, the primary mitigation measure should be avoidance. The proponent should avoid contact with or disturbance to each species, its habitat and/or its residence.

Monitoring should be undertaken by the proponent to determine the effectiveness of mitigation and/or identify where further mitigation is required. As a minimum, this

monitoring should include recording the locations and dates of any observations of Species at Risk, behaviour or actions taken by the animals when project activities were encountered, and any actions taken by the proponent to avoid contact or disturbance to the species, its habitat, and/or its residence. This information should be submitted to the appropriate regulators and organizations with management responsibility for that species, as requested.

For species primarily managed by the Territorial Government, the Territorial Government should be consulted to identify other appropriate mitigation and/or monitoring measures to minimize effects to these species from the project.

Mitigation and monitoring measures must be taken in a way that is consistent with applicable recovery strategies and action/management plans. The Canadian Wildlife Service of Environment Canada is interested in observations of birds, especially observations of birds identified as Species at Risk (e.g., Ivory Gull). Observations can be reported through the NWT/NU Bird Checklist program.

MKI Response: Species at risk that could be found in the study area during the survey period are identified and discussed in Section 4.7 of the EIA report. Mitigation for marine mammals at risk is stated in Section 5.2.2 and in Section 5.3, in keeping with the Statement of Canadian Practice on the Mitigation of Seismic Noise in the Marine Environment. Ivory gull observations will be provided by the marine mammal observer and reported to CWS upon conclusion of the survey.

MKI Response: Baffin Fisheries Coalition

Comment: *Until we are provided scientific evidence that seismic testing does not affect the disbursement of fish species that no approval is provided for seismic reflection surveys in the prolific fishing areas of 0A or 0B.*

MKI Response:

Finfish

There are some data available on the hearing sensitivities of finfish (see Popper and Carlson 1998; Popper et al. 2003 for reviews). The hearing ability of fish varies considerably by species, for example, cod, salmon, America plaice and herring have hearing sensitivities between 80 and 200 Hz, with a sensitivity threshold at 80 to 100 dB re 1µPa (Mitson 1995). Fish sounds are normally generated in the range of 50 to 3,000 Hz. Fish use sound for communication, navigation and sensing of prey and predators. Sound transmission is thought to play an important role in cod and haddock mating (Engen and Folstad 1999, Hawkins and Amorin 2000). Seismic signals are typically in the range of 10 to 200 Hz (Turnpenny and Nedwell 1994) and will, therefore, overlap slightly with signals produced by fish; however, detecting a signal does not mean the fish will have any measurable reaction to the noise.

Potential effects of sound on marine life are commonly categorized as either physical or behavioral. Therefore research activities related to fish have focused on these two broad categories. The first is generally investigated using either laboratory or controlled experiments of some kind in the field, where fish are usually caged in a stationary location and exposed to a sound source of some kind activated at some distance away. Potential behavioral effects are much more difficult to investigate in a controlled way. Some studies have looked at fisheries catch data or acoustic monitoring data.

Numerous studies have been conducted over the years, some have reported evidence of physical effects, and some have not. Some have reported short-term movement of fish away from a sound source, others have not. Wardle et al. (2001) report that neither finfish nor invertebrates showed signs of moving away from a reef on the west coast of Scotland after four days of seismic source firing.

The frequency of sound energy from seismic sources overlaps with the hearing range of fish species, but responses to these sounds vary between species.

Several studies have shown that repeated exposure to sound, such as that produced by a seismic compressed air source, can result in temporary hearing loss and physical damage to the ear (Enger 1981; Hastings et al. 1996; Amoser and Ladich 2003; McCauley et al. 2003; Popper et al. 2005). There are, however, substantial differences in the effects of a seismic source on the hearing thresholds of different species. Popper et al. (2005) showed that fish with poorer hearing, such as pike (Esox lucius), showed little hearing loss in response to seismic source activity, while fish with good hearing, such as lake chub (Couesius plumbeus), showed the most hearing loss. It should be noted however, that such studies are laboratory based, whereby an exposed fish is not able to move away from the repeated exposure to a sound source. A scenario that is not

representative of a seismic source being towed by a moving vessel in an area of open ocean where any fish that are present are free to move away.

Studies have shown that exposure to intense sound can affect the auditory thresholds of fish resulting in temporary threshold shifts (TTS) under certain conditions (i.e. Amoser and Ladich 2003; Smith et al. 2004). However, these studies focused on captive fish that were exposed to sounds for periods of 10 minutes for 12 or 24 hours. TTS may seldom (or never) occur in the wild unless fish are prevented from fleeing the irritant (LGL Limited 2005). Threshold shifts affect the fish's ability to hear its natural full range of sound.

Studies have shown that physical effects may occur within several metres of an active seismic source. Whereas the spatial extent of behavioural reactions is greater than that of physical reactions, some studies indicate that behavioural changes are very temporary while others imply that marine animals might not resume pre-exposure behaviours or distributions for several days (Engås et al. 1996, Løkkeborg 1991, Skalski et al. 1992).

The spatial range of response in fish will vary greatly with changes in the physical environment in which the sounds are emitted. In one environment, fish distribution has been shown to change in an area of 40 x 40 nautical miles and 250 to 280 m deep for more than five days after recording ended, with fish larger than 60 cm being affected to a greater extent than smaller fish (Engås et al. 1996). Payne et al. (2008) in their review on seismic effects on fish that "Regarding cod, Engås et al. (1996) provided strong evidence for effects but the results have been critiqued by Gausland (2003) who noted that the catch rates were not statistically different than normal variation in catch rates. For the purpose of this review, two senior scientists with expertise in cod science review the original work and the critique. They agreed that the study of Engås et al. (1996) was of note, but Gausland's critique was also of merit. Granting the difficulty in carrying out such studies, the scientists noted the lack of a control(s) for the study of Engås et al. (1996). Concern was also expressed that a number of replicates would generally be required for statistical validity. Confounding factors between control and test groups in any such experiments could also include such factors as locale, fish size, school size, nature of prey on which fish might be feeding at the time (e.g. capelin which are sensitive to sound and may move away from the area versus shrimp which are indicated not to be sensitive to sound), whether the fish were "migrating", and whether other ship traffic might be traversing the area at the time.

In 2009, a study was conducted during the Norwegian Petroleum Directorate's seismic survey program off the coast of Vesterålen, Northern Norway in order to investigate the potential effect of seismic sound on commercial fish species (Løkkeborg, 2010). Other than four chartered gillnet and longline vessels, no other commercial fishery vessels were operating in the area. These vessels fished for Greenland halibut, redfish, saithe and haddock in the periods before (12 days), during (38 days) and after (25 days) the seismic data acquisition. Gillnet catches of Greenland halibut and redfish rose during seismic activity and remained higher after the end of the campaign than they had been before the start of seismic activity. Longline catches of Greenland halibut fell during the seismic campaign, but rose again in the course of the following 25-day period. The results for saithe revealed a decline (not statistically significant) in gillnet catches both during and after seismic activity. Based on the acoustic survey estimates, the results were interpreted as an indication that saithe partly left the area. The longline catches of

haddock did not reveal statistically significant differences in catch rates from before and during the seismic survey. The area in which the haddock fishery took place was less affected by the sound of the seismic air source than the fishing grounds for the other species. Nevertheless, there was a decline in haddock catches when the seismic vessel approached this area. The acoustic survey of the distribution of demersal fishes confirms the results of the fishing experiments. During seismic activity, lower concentrations of saithe were measured in the area, whereas no changes in the distribution of the other demersal fishes were observed. The results of this study differ from those of previous studies that revealed significant reductions in trawl and longline catch rates.

Sound measurements during the same study showed that the fish were exposed to sound levels within a range where obvious changes in swimming activity can be expected. It has been suggested that an increased level of swimming activity may have resulted in the Greenland halibut, redfish and ling more liable to be taken in gillnets, while the saithe may have migrated out of the area.

Most available literature (Blaxter et al. 1981, Dalen and Raknes 1985, Pearson et al. 1992, McCauley et al. 2000a, 2000b, Davis et al. 1998) seems to indicate that the effects of noise on fish are brief and if the effects are short-lived and outside a critical life cycle period, they are expected not to translate into biological or physical effects.

There are well documented observations of fish and invertebrates exhibiting behaviours that appeared to be in response to exposure to seismic activity like a startle response, a change in swimming direction and speed, or a change in vertical distribution (Hassel et al. 2003, Wardle et al. 2001, McCauley et al. 2000a, 2000b, Pearson et al. 1992, Schwarz and Greer 1984, Blaxter et al. 1981) although the significance of these behaviours is unclear. The effects of nearby air sleeve operations on fish as determined from several studies are summarized in Table 1.

Table 1: Summary of Behavioural Effects of Fish and Invertebrates from Nearby Air Sleeve Operations

Reference	Level (dB re 1 µPa $_{(rms)}$)	Species	Effects
McCauley *et al.* (2000a,b)	156-161	various fishes	Common 'alarm' behaviour of forming 'huddle' on cage bottom centre, noticeable increase in alarm behaviours begins at lower level
Pearson *et al.* (1992)	[a]149	rockfish (*Sebastes* spp.)	Subtle behavioural changes commence
Pearson *et al.* (1992)	[a]168	rockfish	Alarm response significant
McCauley *et al.* (2000a,b)	>171	fish ear model	Rapid increase in hearing stimulus begins
McCauley *et al.* (2000a,b)	182-195	fish (*P. sexlineatus*)	Persistent C-turn startle
Pearson *et al.* (1992)	100-205	selected rockfish species	C-turn startle response elicited
Wardle *et al.* (2001)	[b]183-207	various wild finfish	C-turn startle responses
McCauley *et al.* (2000a,b)	146-195	various finfish	No significant physiological stress increase
McCauley *et al.*	174	Squid *(Sepioteuthis*	Startle (ink sac fire) and avoidance to startup

Table 1: Summary of Behavioural Effects of Fish and Invertebrates from Nearby Air Sleeve Operations

Reference	Level (dB re 1 µPa $_{(rms)}$)	Species	Effects
(2000a,b)		*australis)*	nearby
McCauley *et al.* (2000a,b)	156-161	Squid	Noticeable increase in alarm behaviours
McCauley *et al.* (2000a,b)	166	Squid	Significant alteration in swimming speed patterns, possible use of sound shadow near water surface

Source: adapted from McCauley *et al.* 2000a; 2000b.

[a] - converted from mean peak to rms using -12 dB correction from 7,712 records from Bolt 600B air-sleeve.

[b] - correction of -12dB applied (peak to rms).

It should be noted that Table 1 identifies the various conversions required between the different measurements units commonly used to describe underwater sound levels. Historically Sound Pressure Level (SPL) has been expressed in terms of peak, peak-to-peak and/or RMS dB re 1µPa. More recently Sound Exposure Level (SEL) has been introduced as an appropriate measure expressed in terms of dB re 1µPa²·s (Southall et al. 2007).

Therefore, it is important to know which measures have been used for the any studies in order to enable any comparison between studies of the actual number values of sound levels being presented.

Fish are known to exhibit a temporary 'startle' reaction when exposed to sudden changes in sound levels, but seem to acclimate to "ambient noise". Sound generated by seismic activity may cause some species to avoid the zone of influence around the seismic vessel. It should be noted however that a seismic source is not stationary during a seismic survey operation and is being towed behind a moving vessel throughout a survey program. Therefore, any avoidance is likely to be temporary and localized. Studies note that many species of fish dive to avoid intense sound (Protasov 1966, Schwartz and Greer 1984, Knudsen et al. 1992). Blaxter et al. (1981) found that schooling herring changed direction with a sudden exposure to a sound level of 144 dB re 1 µPa and when the source level increased gradually over time (soft-start or ramp-up), they reacted to a sound levels around 5 dB higher. In one trial, Løkkeborg and Soldal (1993) estimated that avoidance behaviour in fish occurs between 160 and 171 dB re 1 µPa. McCauley et al. (2000) conducted trials with captive fish and found that increases in swimming behaviour occurred when seismic sound levels reached 156 dB re 1 µPa.

The Science Review Working Group (CNSOPB 2002), which evaluated two proposed seismic surveys near Cape Breton, agreed that although the duration of behavioural effects of seismic activity on marine fish are uncertain, indications exists, as described in above studies, that displacement of marine finfish is short-term.

If a seismic survey overlaps with the presence of migrating fish species (such as redfish and cod), startle responses and temporary changes in swimming direction and speed could be expected, but schooling behaviour is not expected to be affected (Blaxter et al.

1981). Any temporary change in behavior is not expected to interrupt the natural migration instinct to a spawning or feeding area.

Auditory Masking

Acoustic communication is important during cod spawning. Sound recordings at the major spawning ground off the Lofoten Islands, Norway revealed a 'hushed hubbub' or period of reduced sound production, at approximately 40 to 500 Hz during the spawning period.

The potential effect that seismic activities may have on masking communications by fishes is not well documented. Whilst there is overlap in the frequency of seismic signals and the sounds emitted by fish and therefore potential for sound reception and production in fish to be affected (Myrberg 1980). There have been no published reports on the effects of hearing impairment or excessive masking on the acoustic communication behaviour of any fish species.

Experiments on goldfish indicate that fish are capable of "auditory scene analysis", meaning that a sound stream of interest can be "heard out" and analyzed for its informational content independently of simultaneous, potentially interfering sounds (Fay 1998, in MMS 2004). These studies were carried out using repetitive impulses or clicks as signals and as potentially interfering sounds. These results suggest that the presence of intermittent, audible air sleeve source points would not necessarily impair fishes in receiving and appropriately interpreting other biologically relevant sounds from the environment (MMS 2004).

Invertebrates/crustaceans

Crustaceans appear to be most sensitive to low frequency sounds, less than 1,000 Hz (Budelmann 1992; Popper et al. 2001). Some crustacean species generate low frequency sounds which presumably serve a communicatory function, for example, the spiny lobsters (Palinuridae) and the snapping shrimps (Alpheidae). Because invertebrates lack air-filled cavities, it is likely that they would respond to the particle motion component of sound rather than to sound pressure, and as a consequence their sensitivity to sound is likely to be inferior to that of fish. Crustaceans have a variety of hair-like sense organs that are potentially capable of responding to mechanical stimuli, including sound, but similar structures have not been identified in bivalve and gastropod molluscs. These mollusc groups are therefore unlikely to change their behaviour in response to seismic sound waves, although they could show physiological reactions and anatomical damage. The highly mobile predatory cephalopod molluscs (squid, octopus) are thought to be insensitive to sound.

The subject of acoustic detection in decapod crustaceans has been previously investigated over the past few decades to estimate invertebrate response to sound and vibration (Popper et al. 2001). A number of physiological studies of statocysts of marine crabs suggest that some of these species are potentially capable of sound detection (Popper et al. 2001). Decopods have surface hair-like cells that serve as chemoreceptors and mechanoreceptors to detect water flow and vibrational stimuli and they respond to frequencies up to 100 Hz with a single spike per cycle. Chorodontal organs, associated with flexible body appendages, signal joint position, movement and stress and they respond to low-frequency waterborne vibrations. Statocysts are located

on the basal segment of each antennule in crabs and other body areas in other crustaceans are involved in maintaining equilibrium. They are unlikely to respond to acoustic stimulation. Norway lobster (Nephrops norvegicus) showed postural responses to sound frequencies of 20 to 180 Hz in the lab (Goodall et al. 1990). In the field the response was due to particle displacement and not pressure. Responses were analogous to fish lateral line which response to water motions produced within a fish-length of the detecting animal (Popper et al. 2001).

Behavioural effects of exposure of caged cephalopods (50 squid and two cuttlefish) to sound from a single 20-inch air sleeve have been reported (McCauley et al. 2000a). The behavioural responses included squid firing their ink sacs and moving away from the air sleeve, startle responses and increased swimming speeds. No squid or cuttlefish mortalities were reported from exposures to this air source.

Increased stress as a response to external factors is generally difficult to measure in invertebrates. However, changes in relative movement when exposed to a sound field may be a good indicator of stress. Christian et al. (2004) discuss the startle responses observed by snow crabs held in a DFO tank and exposed to sounds produced by the clanging of metal bars. Snow crabs were observed immediately drawing in their legs and proceeding to escape the region of the imposing sound. When exposed to a 200 cu. in. array located at a distance of 50 m, caged as well as tagged snow crab demonstrated little to no movement; they did not draw in their legs, and they remained in their original position (Christian et al. 2004). Thus, seismic sound fields are not anticipated to cause adverse effects by increasing stress on snow crabs.

Statistical analysis of seismic survey data and commercial catch rate data (from Victoria, Australia from 1978 to 2004), was used to determine the effects of seismic activity on rock lobster. Correlations show that there is no evidence to indicate that catch rates were affected by seismic activity (Parry and Gason 2006). Short term changes in catch rates in the study area coincided with changes in adjacent areas not subject to seismic activity (Parry and Gason 2006).

Mitigation

The source ramp up procedure implemented as standard during seismic surveys will give fish an opportunity to temporarily leave the areas while noise levels are above ambient. DFO (2004) concluded that some finfish exposed to seismic sounds are likely to exhibit a startle response, a change in swimming pattern and/or a change in vertical distribution. However, these effects are expected to be short term and of low ecological significance except where fish reproductive activity may be affected (DFO 2004). Although there is no evidence of an adverse impact of seismic activity on the spawning success of fish, there is sufficient concern to suggest that a precautionary approach to the use of seismic equipment during spawning is adopted.

To minimize sudden changes in noise levels, MKI will implement a ramp-up procedure. Nedwell et al. (2003) considered this effective mitigation for finfish.

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Comment: *Should seismic work be approved the 0A and 0B that it be conducted when the harvesting vessels are out of the area*

MKI Response: Avoidance is the prime mitigation measure to reduce the conflict with fishers. Further discussions with fishers and fishing organizations will be scheduled in 2012 to develop survey plans.

Comment: *Should seismic work go ahead in 0A or 0B when we are fishing and the catch per unit effort decreases then we fully expect to be compensated for the decrease in our average catch per unit effort. We have been gathering statistics on our catch per unit effort and have a good data base of catch efforts daily, weekly, monthly and annually.*

MKI Response: The catch data collected by BFC is valuable for analysis of catch effort and will supplement DFO data for a complete overview of fishing efforts. MKI will meet with BFC representatives to coordinate activities to mitigate potential concerns and so no lost fishing time occurs.

Comment: *Should seismic work go ahead in 0A and 0B and should we lose fishing days then we fully expect to be compensated for the days fishing lost*

1. *That there is significant consultation between fishing industry stakeholders and regulators before and during the carrying out of any seismic reflection surveys.*
2. *Subject to Nunavut Land Claims Agreement – Impact and Benefits*

MKI Response: Arctic Fisheries Alliance

Comment: *In Section 4.9.1 it is stated that "Turbot catches in 2007 were near the survey area but were concentrated within extent of the land-fast ice and along the Canada-Greenland international boundary (figure 50); this represents the farthest extent of the survey. Interactions with this fishery are not expected to be significant." This statement is erroneous as it is based on old data from 2006-07. In the earlier years of the turbot fishery there was heavy concentration of catches around and within the Narwhal exclusion zone. Since then fishing in the exclusion zone has been banned, and the turbot fishery has expanded both south and more particularly north, with some vessels fishing as far north as Pond Inlet; however, the fixed gear fishery is generally concentrated closer to Qikiqtarjuaq.*

MKI Response: MKI concurs with the finding.

Comment: *In Section 5.2.7 it is admitted that "The fixed gear (gill nets and long lines) of the turbot fishery poses the highest potential for gear conflict if they are concurrent and co-location with seismic survey operations". There is reference in this section to "compensation paid for determined losses" and "...mitigation plans to avoid active fishing areas" together with the statement that" ...the economic impacts on fishers would be negligible, and thus not significant. Section 5.2.12 deals with accidental damage to fishing gear and provision for compensation, including "...any additional financial loss that is demonstrated to be associated with the incident ...".*

MKI Response: The additional financial losses refers to those losses associated with lost or damaged gear, such as fuel costs to steam back to port to repurchase and redeploy gear.

Comments: *Gill nets are usually left in the same location throughout the entire fishing season and are not relocated on a regular basis. Moving gear away from the path of a seismic ship requires considerable effort and loss of fishing time. It may take a week or more to relocate gear and then wait for further "soak time". Will, as is the case with mobile fishing gear, the seismic vessel be required to remain a certain distance from fixed gear?*

MKI Response: It is optimal for both parties that avoidance of fixed fishing gear is the prime mitigation.

Comments: *Section 5.2.10 discusses communications with the fishing industry and refers to communications with fisheries organizations and notices on the CBC Radio's Fisheries Broadcast. While these measures may have been used for southern fisheries, they are not suitable or adequate for the Nunavut fishery. As there are only four quota holders in the offshore Nunavut fishery it would be more appropriate if they could each be placed on an email list for appropriate notices. Notices should include access to daily tracking location information on the seismic vessel so that the fishing fleet can follow the location of the seismic vessel and be informed in advance of its planned route.*

MKI Response: MKI concurs that CBC Radio Fisheries Broadcast is not a suitable medium of communication. Notice to Shipping is suitable but not the only means to

broadcast that information. As suggested, an email notification to the quota holders of daily vessel location and planned tracks will be the responsibility of the FLO.

Comment: *It is our understanding that when the fishing industry has a claim for damages against any company involved in the oil industry it generally takes a long time for them to be compensated and this can have a negative impact on cash flow. We insist on a commitment that any claims be settled within 60 days from date of notice of claim.*

MKI Response: MKI agrees to the timeframe payment for compensation of lost or damaged gear caused by contact with the seismic vessel, its deployed equipment, or associated support vessels.

MKI Response: Government of Nunavut- Dept of Executive & Intergovernmental Affairs

Comment: *Community Consultation – The Government of Nunavut expects that any development with and near Nunavut will include exemplary consultation with Nunavummiut. This includes proponent's continued efforts to inform nearby communities….*

MKI Response: MKI issued a letter to QIA on July 12, 2011 to inform QIA that after much careful deliberation PGS and TGS have decided to postpone the Davis Strait/Baffin program until 2012. MKI will continue to **develop a strategy for engagement with the communities.**

Comment: *Develop a community consultation plan that identifies clear consultation goals to allow activities to be monitored in order to determine if these goals have been attained. Further, by working with the communities on developing this consultation plan, the government of Nunavut can help identify best practices and provide advice and assistance to develop communications and consultation plans.*

MKI Response: MKI will contact the Government of Nunavut to share our consultation plan with them, and would appreciate assistance and advice from the Government to identify best practices and provide advice and assistance to develop effective communications.

MKI has signed a contract with NEXUS Coastal Resource Management for the provision of advisory and facilitation services related to the development of a strategy for engagement of indigenous harvesters and community organizations, related to the implementation of 2D Seismic Survey in the coastal waters of Nunavut. The design and implementation of an Aboriginal Traditional Knowledge Study will also be undertaken, which will include a current use study in support of the seismic study. A full consultation strategy is expected to be available in February 2012.

Comment*: The government of Nunavut expects that the proponent will provide maximum social and economic benefits to the people in nearby communities. Where possible, marine mammal observer and project liaison officers should be trained and hired from Nunavut communities. Any effort to build technical capacity and improve job skills with local residents is strongly encouraged.*

MKI Response: MKI is working with the Arctic College in Iqaluit and Pond Inlet to arrange a Marine Mammal Observer (MMO) Training Course for the classes of Environmental students (2 classes 13 students in Iqaluit) and (one class 13 students in Pond Inlet). In the MKI consultation plans that are currently being developed, the goal will be to engage with communities to identify a project liaison officer to work with MKI to share information and knowledge for the project.

Comment *- 4.5.1. The text says the Ringed Seal adults would be inshore in the summer (20 year old data) and yet the general distribution map from 2010 data shows them mainly in the offshore are where the survey would be taking place. Please clarify.*

MKI Response: The map basically shows that ringed seals can occur throughout the project area, although there is a seasonal difference due to life history of the species. Arctic ringed seals generally remain in contact with drifting pack ice or land fast ice for most of the year and rest, pup, and moult there. In autumn and early winter, as openings in the ice start freezing over, the seals create breathing holes in the ice. They continue to maintain these holes, sometimes through ice up to 2m thick, with their strong claws. During winter and early spring, the Arctic ringed seals dig caves or lairs into the drift snow that has gathered above the breathing holes, these are often multi-chambered lairs offering protection from the extreme cold and polar bear predation. Seals typically maintain two or more lairs simultaneously; the distance between these lairs ranges up to 4.5km.

Pups are generally born in the lairs from mid-March to mid-April. They are born with a white coat, which they shed within 4-6 weeks. Nursing is thought to last for about 40 days and nursing mothers make foraging trips, spending altogether about 50-80% (individual variation) of their time in the water. Little is known about the Arctic ringed seal's mating system, but mating is thought to take place in mid-late May, presumably under the ice near the birth lair. Moulting generally takes place in mid-May to mid-July, the seals basking on the ice.

Many seals are reported to migrate (e.g. north-south or inshore-offshore) on a seasonal basis in response to ice availability and there is evidence of long-distance migration and dispersion, particularly for juvenile seals.

Comment: *4.5.3 Describes Harp Seal location and whelping areas that exist where the survey will be taking place, but there is no project impact statement for Harp Seal. Please clarify.*

MKI Response: Whelping of harp seal occurs in March–April on the ice. The seismic survey window of opportunity is planned to commence later in the summer months, thus it will not be occurring through sea ice when harp seals are whelping.

Comment: *4.5.5 Hooded Seal impacts should be addressed.*

MKI Response:

There are no studies specific on hearing of hooded seals relative to seismic surveys.

Few studies of the reactions of pinnipeds to noise from open-water seismic exploration have been published (for review of the early literature, see Richardson et al. 1995). However, pinnipeds have been observed during a number of seismic monitoring studies. Monitoring in the Beaufort Sea during 1996 to 2002 provided a substantial amount of information on avoidance responses (or lack thereof) and associated behaviour. Additional monitoring of that type has been done in the Beaufort and Chukchi Seas in 2006 to 2009. Pinnipeds exposed to seismic surveys have also been observed during seismic surveys along the U.S. west coast. Some limited data are available on physiological responses of pinnipeds exposed to seismic sound, as studied with the aid of radio telemetry. Also, there are data on the reactions of pinnipeds to various other related types of impulsive sounds.

Early observations provided considerable evidence that pinnipeds are often quite tolerant of strong pulsed sounds. Ringed seals near an artificial island drilling site were monitored before and during development of the site. Although air and underwater sound was audible to the seals for up to 5 km, there was no change in their density in that area between breeding seasons before and breeding seasons after development began (Moulton et al. 2003). During seismic exploration off Nova Scotia, grey seals exposed to noise from various seismic sources reportedly did not react strongly (J. Parsons in Greene et al. 1985). Pinnipeds, in both water and air, sometimes tolerate strong noise pulses from non-explosive and explosive scaring devices, especially if attracted to the area for feeding or reproduction (Mate and Harvey 1987; Reeves et al. 1996). Thus, pinnipeds are expected to be rather tolerant of, or to habituate to, repeated underwater sounds from distant seismic sources, at least when the animals are strongly attracted to the area.

Visual monitoring from seismic vessels has shown that pinnipeds frequently do not avoid the area within a few hundred metres of an operating seismic air source array (Harris et al. 2001). However, the telemetry research of Thompson et al. (1998) suggests that reactions may be stronger than has been evident from visual studies. In the U.K., a radio-telemetry study demonstrated short-term changes in the behaviour of harbour and grey seals exposed to air sleeve pulses (Thompson et al. 1998). Harbour seals were exposed to seismic pulses from a 90 in^3 array (3 x 30 in^3 air sleeves), and behavioural responses differed among individuals. One harbour seal avoided the array at distances up to 2.5 km from the source and only resumed foraging dives after seismic activities stopped. Another harbour seal, exposed to the same small air sleeve array, showed no detectable behavioural response, even when the array was within 500 m. Grey seals exposed to a single 10 in^3 showed an avoidance reaction; they moved away from the source, increased swim speed and/or dive duration, and switched from foraging dives to predominantly transit dives. These effects appeared to be short-term as grey seals either remained in, or returned at least once to, the foraging area where they had been exposed to seismic pulses. These results suggest that there are inter-specific as well as individual differences in seal responses to seismic sounds.

Offshore California, visual observations from a seismic vessel showed that California sea lions "…typically ignored the vessel and source array. When [they] displayed behaviour modifications, they often appeared to be reacting visually to the sight of the towed array. At times, California sea lions were attracted to the array, even when it was active. At other times, these animals would appear to be actively avoiding the vessel and array" (Arnold 1996). In Puget Sound, sighting distances for harbour seals and California sea lions tended to be larger when a seismic air source was operating; both species tended to orient away whether or not the array was active (Calambokidis and Osmek 1998). Bain and Williams (2006) also stated that their small sample of harbour seals and sea lions tended to orient and/or move away upon exposure to sounds from a large seismic air array.

Monitoring work in the Alaskan Beaufort Sea during 1996 to 2001 provided considerable information regarding the behaviour of seals exposed to seismic pulses (Harris et al. 2001; Moulton and Lawson 2002). Those seismic projects usually involved arrays of 6 to 16 air source elements with total volumes 560 to 1500 in^3. Subsequent monitoring work in the Canadian Beaufort Sea in 2001 to 2002, with a somewhat larger seismic source array (24 elements, 2250 in^3), provided similar results (Miller et al. 2005).

The combined results suggest that some seals avoid the immediate area around seismic vessels. In most survey years, ringed seal sightings averaged somewhat farther away from the seismic vessel when the seismic array was active than when it was not (Moulton and Lawson 2002). Also, seal sighting rates at the water surface were lower during seismic source array operations than during non-operational periods in each survey year except 1997. However, the avoidance movements were relatively small, on the order of 100 m to (at most) a few hundreds of metres, and many seals remained within 100 to 200 m of the trackline as the operating seismic vessel passed by.

The operation of the seismic source array had minor and variable effects on the behaviour of seals visible at the surface within a few hundred metres of the array (Moulton and Lawson 2002). The behavioural data indicated that some seals were more likely to swim away from the source vessel during periods of operational activity and more likely to swim towards or parallel to the vessel during non-operational periods. No consistent relationship was observed between exposure to sound from the seismic source array and proportions of seals engaged in other recognizable behaviours, e.g., “looked” and “dove”. Such a relationship might have occurred if seals seek to reduce exposure to strong seismic pulses, given the reduced sound levels close to the surface where “looking” occurs (Moulton and Lawson 2002).

Monitoring results from the Canadian Beaufort Sea during 2001 to 2002 were more variable (Miller et al. 2005). During 2001, sighting rates of seals (mostly ringed seals) were similar during all seismic states, including periods where the seismic source was not operational. However, seals tended to be seen closer to the vessel during non-seismic than seismic periods. In contrast, during 2002, sighting rates of seals were higher during non-seismic periods than seismic operations, and seals were seen farther from the vessel during non-seismic compared to seismic activity (a marginally significant result). The combined data for both years showed that sighting rates were higher during non-seismic periods compared to seismic periods, and that sighting distances were similar during both seismic states. Miller et al. (2005) concluded that seals showed very limited avoidance to the operating source array.

As noted in relation to Table 1 earlier, in order to enable any comparison between studies of the number values of sound levels being presented, it is necessary to identify which measurement method and therefore unit of measure has been employed to characterize the level of underwater sound.

Historically Sound Pressure Level (SPL) has been expressed in terms of peak, peak-to-peak and/or RMS dB re 1µPa. In recent years Sound Exposure Level (SEL) is being increasingly used as a preferred measure of underwater sound (expressed in terms of dB re 1µPa²·s) when investigating the potential effects of sound on marine animals in order to account for the temporal nature of exposure to underwater sound (Southall et al. 2007). As well as the various conversions required between the different measurements units commonly used for SPL (peak, peak-to-peak and/or RMS dB re 1µPa), additional conversions are required in order to compare SPL values (either peak, peak-to-peak, and/or RMS) and SEL values (dB re 1µPa²·s). It should be noted that Sound Exposure Level (SEL) values are lower than equivalent SPL values. This highlights the importance of knowing which measures have been used for any studies in order to enable any comparison between studies of the actual number values of sound levels being presented.

Most pinnipeds produce sounds with dominant frequencies between 0.1 and 3 kHz (Richardson and Malme 1995). The individual calls of harp seals range from less than 0.1 second to greater than 1 second in duration (Watkins and Schevill 1979). The frequencies contained in seismic and sub-bottom profiler pulses do overlap with some frequencies used by pinnipeds, but the discontinuous, short duration nature of the pulses is expected to result in limited masking of pinniped calls. Data on underwater hearing sensitivities are available for three species of phocoenid seals, two species of monachid seals, two species of otariids, and the walrus (Odobenusrosmarus) (Richardson and Malme 1995, Kastak and Schusterman 1998, Kastak et al. 1999, Kastelein et al. 2002). The hearing sensitivity of most pinniped species that have been tested ranges between 1 kHz to 30 to 50 kHz. In the harbour seal, thresholds deteriorate gradually below 1 kHz (Kastak and Schusterman 1998). Based on these data, it is likely that seismic source pulses are readily audible to pinnipeds.

In pinnipeds, Temporary Threshold Shifts (TTS) associated with exposure to brief pulses (single or multiple) of underwater sound have not been measured. Two California sea lions did not incur TTS when exposed to single brief pulses with received levels of ~178 and 183 dB re 1 µPa rms and total energy fluxes (spectra density level) of 161 and 163 dB re 1 µPa2s (Finneran et al. 2003). The difference between the values of these two measures (178/183dB vs 161/163dB) highlights the importance of knowing which measures have been used in order to enable any comparison between studies of the actual number values of sound levels being presented.

Initial evidence from more prolonged (non-pulse) exposure studies suggest that for similar exposure durations some pinnipeds (harbour seals in particular) incur TTS at somewhat lower received levels than do small odontocetes (Kastak et al. 1999, 2005; Ketten et al. 2001). Kastak et al. (2005) reported that the amount of threshold shift increased with increasing Sound Exposure Level (SEL) in a California sea lion and harbour seal. They noted that, for non-impulse sound, doubling the exposure duration from 25 to 50 minhad a greater effect on TTS than an increase of 15 dB (95 vs. 80 dB) in exposure level. Mean threshold shifts ranged from 2.9 to 12.2 dB, with full recovery within 24 h (Kastak et al. 2005). Kastak et al. (2005) suggested that, for non-impulse sound, SELs resulting in TTS onset in three species of pinnipeds may range from 183 to 206 dB re 1 µPa2s, depending on the absolute hearing sensitivity.

It is expected that—for impulse as opposed to non-impulse sound—the onset of TTS would occur at a lower cumulative SEL given the assumed greater auditory effect of broadband impulses with rapid rise times. The threshold for onset of mild TTS upon exposure of a harbour seal to impulse sounds has been estimated indirectly as being an SEL of ~171 dB re 1 µPa2s (Southall et al. 2007). That would be approximately equivalent to a single pulse with received level ~181 to 186 dB re 1 µPa rms, or a series of pulses for which the highest rms values are a few dB lower.

At least for non-impulse sounds, TTS onset occurs at appreciably higher received levels in California sea lions and northern elephant seals than in harbour seals (Kastak et al. 2005). Thus, the former two species would presumably need to be closer to a seismic source array and/or for longer than a harbour seal before TTS is a possibility. Insofar as we are aware, there are no data to indicate whether the TTS thresholds of other pinniped species are more similar to those of the harbour seal or to those of the two less-sensitive species.

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Comment: *4.9 Commercial Fishing: location maps from 2006-2007 for Turbot and Shrimp are out of date. Please provide an update of the current fishing area data.*

MKI Response: Updated fisheries maps will be provided to the Nunavut government.

Comment: *4.9.3 Please expand on how fishing gear would be avoided. Moreover fishing itself must be avoided, not just gear.*

MKI Response: The primary means of mitigating potential impacts on commercial fisheries activities is to avoid active fishing areas, particularly fixed gear, when they are occupied by harvesters. Any claim of gear damage will be resolved though discussion to reach a mutually agreeable resolution.

The potential for impacts on fish harvesting will, therefore, depend very much on the location of the surveying activities in relation to these fishing areas in any given season. If the survey work is situated away from these fishing areas, the likelihood of any impacts on commercial harvesting will be greatly reduced.

For the transit routes to the survey area, where the survey streamers may be deployed during the outbound segment, a separate route analysis will be prepared and discussions with fishing interests undertaken before the transits, to avoid fixed gear fishing activities.

MKI propose to follow the guidelines developed by the C-NLOPB and CNSOPB to provide guidance aimed at minimizing any impacts of petroleum industry surveys on commercial fish harvesting. These guidelines were developed based on best practices during previous years' surveys in Atlantic Canada, and on guidelines from other national jurisdictions. The relevant guidelines state:

- The operator should implement operational arrangements to ensure that the operator and/or its survey contractor and the local fishing interests are informed of each other's planned activities. Communication throughout survey operations with fishing interests in the area should be maintained;
- The operator should publish a Canadian Coast Guard "Notice to Mariners" and a "Notice to Fishers" via the CBC Radio program Fisheries Broadcast – the latter is not relevant to Nunavut and thus emails to individual quota holders well be effected by the FLO.
- Operators should implement a gear and/or vessel damage compensation program, to promptly settle claims for loss and/or damage that may be caused by survey operations. The scope of the compensation program should include replacement costs for lost or damaged gear.
- Procedures must be in place on the survey vessel(s) to ensure that any incidents of contact with fishing gear are clearly detected and documented (e.g., time, location of contact, loss of contact, and description of any identifying markings observed on affected gear).
- Seismic activities should be scheduled to avoid heavily fished areas, to the extent possible. The operator should implement operational arrangements to ensure that the operator and/or its survey contractor and the local fishing interests are informed of each other's planned activities. Communication throughout survey operations with fishing interests in the area should be maintained. The use of a 'Fisheries Liaison Officer' (FLO) onboard would be considered an acceptable approach.

Avoidance

Potential impacts on fishing (catch success as well as gear conflicts) will be mitigated by avoiding heavily fished areas when these fisheries are active (specifically the fixed gear turbot areas) to the greatest extent possible. Most of the fishing in the past has been concentrated in well-defined areas within the Project Area. During any survey, the location of current activities will be monitored by the ship and the FLO (see below) and plotted by project vessels, and fishing boats will be contacted by radio. Survey personnel will also continue to be updated about fisheries near the survey. The updated mapping

of activities will also be an important source of fisheries information for the survey operators.

Communications

During the ongoing fisheries consultations for this and other surveys, fisheries representatives noted that good communications is one of the best ways to minimize interference with fishing activities. Communication will be maintained (directly at sea) to facilitate information exchange with fisheries participants. This includes such groups as DFO managers, independent fishers, representatives of fisheries organizations, and managers of other key corporate fisheries in the area.

Relevant information about the survey operations will also be publicized using established communications mechanisms, such as the *Notices to Shipping* (Continuous Marine Broadcast and NavTex) as well as direct communications between the survey vessel and fishing vessels via marine radio at sea. This will also include any transit routes.

Fisheries Liaison Officer

As a specific means of facilitating at-sea communications, and informing the survey vessel operators about local fisheries, MKI will have an onboard fisheries industry liaison officer as a "fisheries representative". The FLO will remain on the relevant survey vessel or support vessel for the entire program. This will provide a dedicated marine radio contact for all fishing vessels in the vicinity of operations to discuss interactions and resolve any problems that may arise at sea. This person will assist the vessel's bridge personnel to become informed about any local fishing activities.

Observers have proven effective in the Nova Scotia sector since 1998. Since 2002, FLOs have been utilized in Newfoundland and Labrador waters and have proven highly effective in communicating with fishers at sea and avoiding gear and fishing conflicts in this sector.

Comment: *4.9.4 Have the Fisheries Liaison Officers (FLO) been identified and have they been in contact with industry? Please clarify what steps will be taken to ensure the impartiality of the FLO onboard.*

MKI Response: FLOs have not been identified for this survey; in keeping with standards established in Atlantic Canada, the qualifications for the FLO are listed below. MKI intends to work with B.F.C. to identify possible candidates and has been in contact with Michael Walsh with Nunavut Training Consortium to discuss possible candidates. MKI will continue with these efforts.

Qualifications of FLOs

FLOs should be familiar with the area's fisheries and industry, and undergo required training as follows:

- Marine Radio Operators Certificate
- Basic First Aid Certificate
- Valid Marine Emergency Duties (MED) Certificate that includes A1 Basic Safety, B1 Survival

- Craft, B2 Marine Firefighting
- Valid mariners/seafarers medical certificate (health certification)
- WHMIS certificate (training may also be provided during mobilization)
- Passport (as a contingency)
- Familiarity with the identification of marine mammals and seabirds (MMO course seabird)
- Observation course preferable)
- HUET training if helicopter transits are required.

Responsibilities

Operator:

- Provide FLO with survey information and EA report
- Provide living quarters and meals for the FLOs while on the vessel
- Provide FLO with access to e-mail and/or fax for reporting purposes
- Pay for FLO through FFAW / (Baffin Fisheries Coalition)

FFAW:

- Supply qualified FLOs
- Manage all other aspects of the FLO program, including FLO payment and all insurance issues.

Fisheries Liaison Officer:

- Observe activities which may affect the fisheries industry
- Help identify, avoid and resolve possible fisheries issues / conflicts, e.g.
    - Make radio contact with any fishing boats in the area and stay in touch generally
- Help identify / locate any fishing gear in and near the current survey area so it can be avoided
    - Determine gear type, layout, fishing plans (when in area, when leaving)
    - Advise bridge about best course of action to avoid gear / fishing activities
    - Inform fishers nearby about the survey
    - Serve as initial contact in case of any gear damage; help to identify gear owners if encountered;
- Verify gear damage.
- Provide offshore personnel with other relevant information and briefings
- Monitor response to emergency situations or drills
- Conduct bird, marine mammal and turtle observations (forms to be provided)
- Attend regular operations briefings
- Attend safety meetings, as requested
- Keep a daily log of all activities and observances, and report on any special issues/concerns to groups noted below
- Complete a written summary report following each rotation. Provide summary reports to the FFAW, the Operator and Single Point of Contact (SPOC, i.e., Canning & Pitt Inc), detailing sightings, environmental issues and fishing vessel traffic.
- To the extent it does not interfere with their main duties list above, and subject to prior approval by the Operator:
- Assist with other routine operations
- Undertake special projects as identified by the operator,

Comment: *5.2 - 5.2.1 Please expand on fish dispersal or habitat abandonment. This is a critical issue that needs to be discussed.*

MKI Response: One of the principal potential impacts of seismic/geohazard surveying on the Commercial Fisheries VEC is related to changes in catch rates resulting from sound-induced behavioural effects (scaring) on fishes. This issue has been raised during many fisher consultations and issues scoping for oil and gas exploration. Some fisheries industry representatives have stated concerns that the sound associated with seismic survey operations may scare finfish from their fishing locations, or discourage benthic species, from entering fishing gear. The likelihood that finfish will move away as the array approaches is considered a factor that helps prevent physical impacts on these species.

While most, though not all, of these studies report some decrease in catch rates near seismic survey areas, there is less agreement on the duration and geographical extent of the effect, ranging from a temporary effect to one several days long, and from very localized effects to decreased catch rates as far as 15 to 20 km away. See in-depth response to Baffin Fisheries on this same question, above.

The potential for impacts on fish harvesting will, therefore, depend very much on the location of the surveying activities in relation to these fishing areas in any given season. If the survey work is situated away from these fishing areas, the likelihood of any impacts on commercial harvesting will be greatly reduced.

Comment: *5.2.7 Fishing Gear Conflict: Compensation must be clearly discussed and described. It must be clear under what circumstances compensation will be made, who will be responsible for compensation, who the fishermen should contact in the event of conflict, and how it can be done in a timely manner. Communication and any procedures that are developed for compensation should be translated appropriately. This has been somewhat addressed in 5.2.12, but should be expanded.*

MKI Response: The resolution of any conflicts will be discussed and developed in partnership with the fishers, either individually and/or through an association.

Comment: *5.2.8 At what distance will fishing areas be avoided? If it is unclear where and when fishing activity is taking place how much notice will the company provide to indicate they will be in the area? Please clarify.*

MKI Response: Further discussion is required with fishers and fisheries associations to determine appropriate scheduling.

Comment: *5.2.11 Has any Single Point of Contact been identified on the industry side?*

MKI Response: A Single Point of Contact is a mitigation used by the C-NLOPB when there are multiple operators working within a common area at the same time. At this time only MKI has a program that is being considered in the Davis Strait, therefore, the FLO will suffice as the contact.

Comment: *5.3 Mitigation measures: Please clarify as to why PAM (passive acoustic monitoring) was not chosen as part of the marine mammal avoidance measures*.

MKI Response: It is widely recognized that the overall performance of towed Passive Acoustic Monitoring (PAM) systems currently available is highly variable and dependent on a number of operational and technical challenges as well as requiring the presence of vocalizing animals. While towed PAM is not yet a proven monitoring technology in Arctic waters, PAM will be implemented on a trail basis to monitor the presence of cetaceans.

Details of the PAM equipment to be used, mode of operation and trial period will be confirmed at a later date.

MKI Response: Qikiqtani Inuit Association

Comment *"we have concluded that the current level of consultation with all affected communities is insufficient. It is suggested that a process be developed whereby all concerns expressed by the affected communities be appropriately addressed and outline the measures to be adopted in the mitigation of any negative impacts incurred from the proposed project activities*

MKI Response: MKI issued a letter to QIA on July 12, 2011 to inform you that after much careful deliberation PGS and TGS have decided to postpone the Davis Strait/Baffin program until 2012 in order to accept the QIA offer to work together to grow community support.

Comment*: The methodology and analysis of how the background scientific information informs the mitigation measures is not readily apparent. QIA requests the proponent provide this methodology, analysis and ultimately how this scientific information and Inuit Qaujimajatuqangit/Traditional Knowledge informs the project design*

MKI Response: MKI is planning to continue to visit a number of local communities in early 2012 to continue to share information about the project, address concerns, and find a representative for the community to work with MKI to build traditional knowledge into the program. MKI has contracted NEXUS Coastal to develop a community engagement plan for meaningful consultation with the communities and relevant organizations. NEXUS Coastal has researched and examined each community and identified major stakeholders, global issues, businesses and previous projects. MKI feels this approach ensures that significant stakeholders, relevant issues and experiences are included in the development of the consultation process.

Comment: *QIA feels that the level of concerns raised by community members requires an independent gathering of traditional knowledge to inform all future oil and gas exploration and development*

MKI Response: As mentioned above MKI will be planning additional visits to the communities to gather a representative from the community that they can work with to incorporate traditional knowledge into the program.

Comment: *QIA notes that Pond Inlet CLARC meeting minutes provide IQ/TI knowledge of the area where the proponent should avoid activity…*

MKI Response: Pond Inlet will be visited in the meeting schedule and an opportunity to discuss this further will be made possible, in order to understand concerns, etc.

Comment: *The community members expressed that all stake holders involved in oil and gas development must set up a process to educate the affected communities…*

MKI Response: Through continuing to visit the communities and build relationships, MKI will continue to try and educate the affected communities on the components of the seismic project.

Comment: *QIA is requesting that the NEB create a relationship with the affected communities that it has authority to issue an authorization.*

MKI Response: MKI would like to be informed of NEB arrangements for planned meetings in the communities so that MKI may have the opportunity to attend and observe.

Recommendations:

1. *The proponent should hold public meetings in all six affected communities to ensure all community concerns are and adequately addressed:*

MKI Response: MKI will continue to make all reasonable efforts to hold meetings in the communities, such as Iqaluit, Clyde River, Pond Inlet, Pangnirtung, Kimmirut, and Qikiqtarjuaq.

2. *The proponent should develop a process to address community concerns and build a relationship, as this project is asking to collect five years of data*

MKI Response: MKI, as mentioned above, is focusing on a strategy of meetings in the communities that will lead to the implementation of someone from the community to work with MKI on the development of the project on behalf of the community and to educate and address concerns. Currently a strategy and meeting schedule is being developed.

3. *The proponent should clearly present a plan to the communities where the community members feel that their concerns are being addressed and how they are incorporated in the project design to mitigate any negative impacts*

MKI Response: MKI will continue to make efforts in the communities to address the concerns of the community members.

The RPS representative and Environmental Manager for PGS traveled to the "Oceans Innovation 2011" conference in Nunavut and efforts were made prior to arrival to meet with QIA to discuss the project going forward and we were unable to confirm a meeting. The RPS representative and PGS representative, Jerry Witney, scheduled a verbal meeting with QIA on Wednesday Dec. 7th and were unable to get confirmation and have thus been forced to re-schedule accordingly.

MKI Response: Shari Gearheard

Comment*: The reasons for strong local opposition to seismic testing center around two main themes, (i) the process of local consultation, and (ii) potential impacts from the testing….*

MKI Response: MKI issued a letter to Nigel Qaumariaq, Environmental and Regulatory Affairs Advisor, Department of Lands and Resources, QIA on July 12th, 2011, to inform the QIA that after much careful deliberation they had decided to postpone the Davis Strait/Baffin Bay portion of the program until 2012.

This decision has been taken due to a combination of factors including the willingness of PGS and TGS (partners in the project), MKI being a wholly owned subsidiary of PGS, to invest more time and resources to consult with the Inuit communities and other stakeholders.

***2. Preamble*:** *Figure 1 on page 13 in the Environmental Impact Assessment depicts the survey location. The NEB notes that according to the figure some survey lines extend below 61 degrees North into waters regulated by the Canada Newfoundland Offshore Petroleum Board.*

Request: Please clarify TGS/PGS/MKI's program area by providing an updated map or location description that clearly indicates the southern extent of the project.

MKI Response: No program lines will extend below 61 degrees north into waters regulated by the C-NLOPB. Appendix 7 shows the coordinate grid overlay with lines instead of just labels as previously provided and demonstrates that all lines do terminate at 61 degrees north.

3. Preamble: *Section 5.4 "Accidents and Malfunctions" of the Environmental Impact Assessment states, "The vessel carries trained personnel and apply specific protocols to deal with equipment malfunctions that may lead to the spill of toxic materials"; however, specific environmental impacts and mitigation measures relating to accidents and malfunctions are not mentioned.*

Request: *Please identify what the accidents and malfunctions related to the project may be, their associated impacts, and what mitigation measures may be applied.*

MKI Response: A risk assessment is carried out as a standard procedure for all operations performed by MKI. However, the risks associated with operating this vessel in this area are no different to those for a fishing vessel or cruise ship.

Because small spills of oil or other harmful substances can have very serious effects on migratory birds, every effort will be taken to ensure that no oil or hydraulic fluid spills occur in the area. MKI will ensure that all precautions are taken to prevent fuel leaks from equipment, and MKI's vessel is required to carry and adhere to a "Shipboard Oil Pollution Emergency Plan" pursuant to MARPOL 73/78, containing a description of procedures and checklists, which govern operations involving hydrocarbons.

4. Preamble: *Section 5.2 of the Environmental Impact Assessment describes potential environmental impacts of the proposed project; however impacts to air quality and water quality are not indicated.*

Request: *Please identify if there may be potential impacts to air quality and water quality as a result of the proposed activity, what these impacts may be and how might they be mitigated.*

MKI Response: With respect to air quality, the major emission sources from the proposed project are the seismic vessel and any support vessels. Operational atmospheric emissions may include vessel exhaust, exhaust fumes from diesel generators, and operational emission of halons during fire fighting or maintenance of air conditioning and refrigeration systems. These emissions are not anticipated to be significant and will be further minimized through best management practices and preventative maintenance procedures. It is expected that project emissions will not cause an exceedance of applicable air quality standards or guidelines. There are limited

emissions sources and few receptors likely to be affected. To ensure that air emissions are minimized, MKI will implement the following mitigation measures:

- Properly maintaining and routinely inspecting ship equipment, minimizing vapour loss from fuel tanks, and minimizing idling of equipment when not in use.
- Adhere to MARPOL Annex VI, Regulations for the Prevention of Air Pollution from Ships; and
- Adhere to the air emissions provisions of the OWTG (NEB *et al.* 2010), including annual reporting of greenhouse gases (GHG).

Malfunctions and accidental events may have an effect on water quality; therefore, an assessment of the effects of hydrocarbon spills on living organisms and special areas, rather than water quality, is the appropriate focus for the environment screening assessment. MKI will implement the following mitigation measures to minimize effects on marine water quality:

- Adhere to the OWTG (NEB *et al.* 2010);
- Comply with the *Fisheries Act* (Section 36);
- Provide a Spill Contingency Plan and Ballast Water Management Plan.

Grey and Black Water - There may be 30 to 50 persons on a seismic vessel at any one time. All liquid discharges will be treated in accordance with the *Offshore Waste Treatment Guidelines* (OWTG) (NEB *et al.* 2002) prior to ocean discharge.

Ballast water - On survey vessels, ballast water is stored in dedicated ballast tanks to improve vessel stability. No oil will be present in ballast/preload tanks or in the discharged ballast/preload water. If oil is suspected to be in water, it will be tested and, if necessary, treated to ensure that oil concentrations in the discharge do not exceed 15 mg/L, as required by the OWTG (NEB *et al.* 2010). Any ballast water discharge will comply with Transport Canada's *Guidelines for the Control of Ballast Water Discharge from Ships in Waters Under Canadian Jurisdiction*.

Bilge Water - Bilge water often contains oil and grease that originates in the engine room and machinery spaces. Before discharge, bilge water is treated in accordance with OWTG (NEB *et al.* 2010) and in conformance with the oil concentration limits set out in the *Regulations for the Prevention of Pollution from Ships and for Dangerous Chemicals* (SOR/2007-86), regarding discharge of water from machinery space bilges, which specify that the discharge will contain no more than 15 mg/L of oil.

Discharges from Machinery Spaces – As specified in the OWTG (NEB *et al.* 2010), bilge water that is to be discharged to sea will be treated such that residual oil concentration does not exceed 15 mg/L. Machinery spaces will be equipped with drip trays, curbs and gutters, and other devices to prevent spilled or leaked materials from entering the water. Waste material from drip pans and work spaces will be collected in a closed system designed for that purpose and will be returned to the process cycle, recycled, or transferred ashore.

5. Preamble: *In section 5.7 of the EIA indicates that RPS Energy had intended to return to some communities for public meetings late May 2011*.

Request: *Please provide an update describing the results of consultation conducted since the submission of the EIA and describe consultation plans going forward.*

MKI Response: Appendix 6 contains minutes taken from the public meetings held in Pond Inlet and Clyde River in May 2011. MKI is currently working on a strategy to continue efforts to consult in local communities closest to the project area. MKI is currently reviewing possible candidates with a background in interacting with Aboriginal people and together are currently working on a strategy and timeframe to continue to consult in the communities in the New Year 2012. This schedule will be provided to NEB as soon as possible.

6. Preamble: *The Non-Technical Summary of the EIA states, "An Operational Project Plan incorporating the measures specified in the Environmental Protection Plan will be implemented to ensure operations are completed in full compliance of the company's stated environmental aims and objectives."*

Request*: Please provide a copy of the Operational Project Plan, the Environmental Protection Plan and the plans requested in the letter of comment to the NEB from Environment Canada dated 28 May 2010: Including*

- Ballast Water Management Plan
- Waste Management Plan
- Survey Acquisition Plan; and
- Spill Contingency Plan

MKI Response: MKI has attached Appendix 1 – Ballast Water Management Plan and Appendix 2 – Waste Management Plan. The survey acquisition plan is ongoing as we continue to engage with the communities and can be provided prior to the start of the project. The Master of the ship has overall responsibility of the SOPEP of the ship, along with the chief officer as subordinate in charge for implementation of SOPEP on board. SOPEP also describes the plan for the master, officer and the crew of the ship to tackle various oil spill scenario that can occur on a ship. MKI has attached Appendix 3 – SOPEP and Appendix 4 - SOPEP approval.

SOPEP contains the following items:

- The action plan contains duty of each crewmember at the time of spill, including emergency muster and actions.
- SOPEP contains the general information about the ship and the owner of the ship, etc.
- Steps and procedure to contain the discharge of oil into the sea using SOPEP equipments.
- Onboard Reporting procedure and requirement in case of oil spill is described.
- Authorities to contact and reporting requirements in case of oil spill are listed in SOPEP. Authorities like port state control, oil clean up team etc are to be notified.
- SOPEP includes drawing of various fuel lines, along with other oil lines on board vessel with positioning of vents, save all trays, etc.
- General arrangement of ship is also listed in SOPEP, which includes location of all the oil tanks with capacity, content, etc.
- The location of the SOPEP locker and contents of the locker with a list of inventory.

Appendix 1. Ballast Water Management

BALLAST WATER MANAGEMENT PLAN (BWMP)

M/S SANCO SPIRIT
IMO 9429936

Report no. 141801120-C

This Ballast Water Management Plan (BWMP) is prepared in accordance with IMO resolution MEPC.127(53),124(53).

Method of Ballast Water Exchange (BWE): Flow through.

Reference documents:
-Approved Trim and Stability manual. Report number: **141-152-105**
-Documentation showing Ballast water system, air and sounding pipes

C	Approved by DnV	27.04-2010	GEH
B	Issued to DnV for approval	12.04-2010	GEH
A	Issued for approval	27.10.2009	GEH
Rev. no.	**Revision**	**Date**	**Sign**

PART A Ship and operating company guidance

Table of contents

1. Ship particulars
2. Purpose of ballast water management (BWMP), and for reporting to port states
3. Ballast water arrangements
4. Ballast water sampling points
5. Procedures for exchange of ballast water
6. Safety – General considerations
7. Officer and crew responsibility and training
8. Duties of appointed ballast water management officer
9. Ballast water reporting form and handling log

PART B APPENDIX, National and international guidance

APPENDIX A1 IMO Assembly Resolutions MEPC 127(53),-124(53)

APPENDIX A2 Existing national ballast water management requirements,

APPENDIX A3 Misc. Drawings

CAUTION

The function of the Ballast Water Management Plan (BWMP) is to assist in complying with quarantine measures intended to minimize the risk of transplanting harmful aquatic organisms and pathogens from ships' ballast water and associated sediments, while maintaining ship safety.

As part of this function the plan will provide information to quarantine officers who wish to learn about a ship's ballast handling system, or to confirm that ballast management has been effectively planned.

The plan should not be used or regarded as a guide to ballasting. Training and shipboard operational practices should already be well established.

1. SHIP PARTICULARS

Ships name	:	**M/V SANCO SPIRIT**
Ships size/type	:	**Seismic Survey Vessel /MM 86 Seismic**
Port of registry	:	**Gibraltar**
Owner	:	**Sanco Holding AS**
Built	:	Vaagland Baatbyggeri as , Norway
Flag	:	**Gibraltar**
International Call signals:		**ZDJN3**
Gross tonnage	:	**4348Tonnes**
Imo number	:	**9429936**

Dimensions:

Lengt o.a.:	**86,50 m**
Lengt b.p.:	**82,95 m**
Breadth:	**16,00 m**
Depth. (DWL)	**5,75 m**

Ballast capacities:

Total water ballast capacity	:	**1441,6 m3**
Total number of segregated ballast tanks on board	:	**18**
Number of other tanks that may be used for ballast:		**0**
Units used for ballast measurement	:	**m3 & Metric tonnes**
List of water ballast tanks, and capacity of each	:	**See table section 3**
Appointed ballast water management officer	:	**Chief Officer**

On occasions of longer voyages, the vessel will exchange at least 95% water ballast at minimum of 200n.m range from shore and in water at least 200m in depth

This plan should be kept available for inspection on request by a port state control officer or by a port state quarantine officer.

2. PURPOSE OF BALLAST WATER MANAGEMENT (BWMP), AND FOR REPORTING TO PORT STATES

2.1 References

1) "THE INTERNATIONAL CONVENTION FOR THE CONTROL AND MANAGEMENT OF SHIPS BALLAST WATER AND SEDIMENTS ,2004"

This plan has been prepared to meet the recommendation of the

2) INTERNATIONAL MARITIME ORGANISATION (IMO) ASSEMBLY RESSUYOLUTION MEPC. 127(53)

Adopted on 22nd July, 2005.

2.2 Background

Studies carried out in several countries have shown that many species of bacteria, plants and animals can survive in a viable form in the ballast water and sediment carried in ships, even after journeys of several weeks duration. Subsequent discharge of ballast water or sediment into the waters of port states may result in the establishment of colonies of harmful species and pathogens which can seriously upset the existing ecological balance. Although other methods have been identified by which organisms are transferred between geographically separated sea areas, ballast water discharge from ships appears to have been prominent among those identified.

The potential for ballast water discharge to cause harm has been recognized not only by the International Maritime Organization (IMO), but also by the World Health Organization which is concerned about the role of ballast water as a medium for the spreading of epidemic disease bacteria.

2.3 Requirements

Some states have established controls on the discharge of ships' ballast water that will minimize the potential for colonization of their rivers and estuaries by nonnative species. The preferred option is mid-ocean ballast water exchange prior to arrival. Accordingly, the countries most concerned have promulgated advice to ships for ballast management, together with a request for their co-operation in applying the techniques voluntarily. Standard procedures have been developed that will be accepted by quarantine authorities as achieving the level of acceptability desired by the port state.

Conflict with safety

Unless applied carefully some of the measures being urged for ballast management can affect a ship's safety, either by creating forces within the hull that are greater than the design parameters, or by compromising the stability of the ship. It is because of concern about this that the IMO became involved in what would otherwise be a purely quarantine matter. It has been recognized by governments and the shipping industry that individual countries' needs should be harmonized with the greater need to ensure the safety of ships, their crews and passengers.

IMO recommends that each ship should be provided with a Ballast Water Management Plan, detailing the way that the ship can comply with any measures demanded by a port state. Once it has been established that the management of ballast is necessary to meet the quarantine requirements of a port state, preparation for it should be treated with the same seriousness as preparation of a cargo plan. All concerned with the operation and safe passage of the ship can thereby be assured that they are both protecting the marine environment and ensuring the safety of the ship and crew.

Summary of records required

To be able to demonstrate at the arrival port that the correct measures have been completed, it will be necessary to maintain a full and accurate ballast log. A suitable outline for such a log is provided in Section 9. Even if a ship is not trading in an area where ballast water information is required, it may later prove worthwhile to have a history of what water has been carried.

Reporting to port states

Several countries have become aware of the potential, through discharge of ships' ballast water, for the transfer into their coastal areas of what are found to be harmful aquatic organisms. Governments have recognized that, before devising mandatory controls on ships, it is necessary to know the scale of what has, until very recently, been an unrecorded procedure.

Concerned countries have therefore introduced a requirement which, though often differing in detail, generally calls for ships to report in advance, to the national monitoring authority, how much ballast water will be on board on arrival, where it was taken on board, and whether a ballast management procedure has been followed. In most cases it is mandatory to make the report, even though the actual ballast exchange in mid-ocean (or other management procedure) remains voluntary.

To assist in this regard, wherever possible the plan contains the format of the relevant national reporting forms.

The forms can be found in section 11 of this model plan. When preparing a ballast water management plan for an individual ship, it may be found possible and convenient to pre-format the reporting forms to suit the ship, so that work for the crew is reduced and opportunities for mistakes in basic details are minimized. For instance, all permanent information such as the ship's name, IMO number, gross tonnage, owner, total ballast capacity, etc., will remain the same for each voyage. Any list of tanks could also be customized to match the ship exactly. Such preparation will ensure that none are missed inadvertently, and will prevent misunderstandings due to personal interpretations.

3. BALLAST WATER ARRANGEMENTS

Tank arrangement, and tank capacities Sanco Spirit

Specific Gravity = 1.025 t/m³ .

3.1 Tank Plan

Drawing is enclosed in the end of report. See also ship file.

*- See drawing of tank arrangements. Ship file **141801001***

3.2 Tank capacity

The below capacity is taken from the vessel's capacity plan.

No	Name	Net. Vol M3	Weight t	LCG m	TCG m	VCG m	MAX FSM tm
1	Forepeak Tk. WBT	66,7	68,4	78,97	0,00	5,47	11,10
2	WB 3 P	82,9	85,0	67,67	2,42	4,21	31,76
3	WB 3 S	82,9	85,0	67,67	- 2,42	4,21	31,76
4	WB 4 P	73,0	73,8	61,99	3,64	2,79	28,88
5	WB 4 S	73,0	73,8	61,99	- 3,64	2,79	28,88
6	WB 5 P	90,6	92,9	55,12	4,51	2,44	117,98
7	WB 5 S	90,6	92,9	55,12	-4,51	2,44	117,98
8	WB 6 CP	71,0	72,8	41,24	3,67	0,97	195,36
9	WB 6 CS	69,4	71.2	41,37	-3,74	0.97	182,10
10	WB 7 CP	53,2	54,5	30,78	3,02	0,93	182,82
11	WB 7 CS	53,2	54,5	30,78	-3,02	0,93	182,82
12	WB 8 P HEELING	51,8	53,1	23,40	7,26	4,66	2,74
13	WB 8 S HEELING	51,8	53,1	23,40	7,26	4,66	2,74
14	WB 8 C	51,1	52,4	24,43	0,00	0,93	425,01
15	WB 10 P	37,9	38,8	8,99	3,28	4,15	87,10
16	WB 10 S	37,9	38,8	8,99	3,28	4,15	87,10
17	WB 11 P	60,1	61,6	1,43	5,63	6,56	36,76
18	WB 11 S	51,4	52,7	0,87	-5,70	6,53	30,25
19	22 ROLL RED 1	131,8	135,1	9,90	0,00	6,33	1029,88
20	23 ROLL RED 2	161.3	165,3	6,61	0,00	6,27	1218,98
	TOTAL	1441,6	1477,7	32,69	0,03	3,86	4040,6

3.3 Pumps used for ballast pumping

Pump Description	Location	Rated Capacity	
		m/3 hr	Pressure
Nr # 1	E/R floor	100 m³ / hour	2,0 bar
Nr # 2	E/R floor	100 m³ / hour	2,0 bar

Piping and pumping arrangements

- See drawing of piping and pumping arrangements. Bilge & Ballast Diagram. Drawing 141801001

Example ballast arrangements for given conditions

Traditional block diagrams of the vessel showing the ballast arrangements for different conditions are recommended.
Drawing 141801001 in ship file

Examples of different conditions; see vessel stability booklet.

3. BALLAST WATER ARRANGEMENTS

Tank arrangement, and tank capacities Sanco Spirit

Specific Gravity = 1.025 t/m³ .

3.1 Tank Plan

Drawing is enclosed in the end of report. See also ship file.

*- See drawing of tank arrangements. Ship file **141801001***

3.2 Tank capacity

The below capacity is taken from the vessel's capacity plan.

No	Name	Net. Vol M3	Weight t	LCG m	TCG m	VCG m	MAX FSM tm
1	Forepeak Tk. WBT	66,7	68,4	78,97	0,00	5,47	11,10
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3	WB 3 S	82,9	85,0	67,67	- 2,42	4,21	31,76
4	WB 4 P	73,0	73,8	61,99	3,64	2,79	28,88
5	WB 4 S	73,0	73,8	61,99	- 3,64	2,79	28,88
6	WB 5 P	90,6	92,9	55,12	4,51	2,44	117,98
7	WB 5 S	90,6	92,9	55,12	-4,51	2,44	117,98
8	WB 6 CP	71,0	72,8	41,24	3,67	0,97	195,36
9	WB 6 CS	69,4	71.2	41,37	-3,74	0.97	182,10
10	WB 7 CP	53,2	54,5	30,78	3,02	0,93	182,82
11	WB 7 CS	53,2	54,5	30,78	-3,02	0,93	182,82
12	WB 8 P HEELING	51,8	53,1	23,40	7,26	4,66	2,74
13	WB 8 S HEELING	51,8	53,1	23,40	7,26	4,66	2,74
14	WB 8 C	51,1	52,4	24,43	0,00	0,93	425,01
15	WB 10 P	37,9	38,8	8,99	3,28	4,15	87,10
16	WB 10 S	37,9	38,8	8,99	3,28	4,15	87,10
17	WB 11 P	60,1	61,6	1,43	5,63	6,56	36,76
18	WB 11 S	51,4	52,7	0,87	-5,70	6,53	30,25
19	22 ROLL RED 1	131,8	135,1	9,90	0,00	6,33	1029,88
20	23 ROLL RED 2	161.3	165,3	6,61	0,00	6,27	1218,98
	TOTAL	1441,6	1477,7	32,69	0,03	3,86	4040,6

3.3 Pumps used for ballast pumping

Pump Description	Location	Rated Capacity	
		m/3 hr	Pressure
Nr # 1	E/R floor	100 m³ / hour	2,0 bar
Nr # 2	E/R floor	100 m³ / hour	2,0 bar

Piping and pumping arrangements

- See drawing of piping and pumping arrangements. Bilge & Ballast Diagram. Drawing 141801001

Example ballast arrangements for given conditions

Traditional block diagrams of the vessel showing the ballast arrangements for different conditions are recommended.
Drawing 141801001 in ship file

Examples of different conditions; see vessel stability booklet.

4. BALLAST WATER SAMPLING POINTS

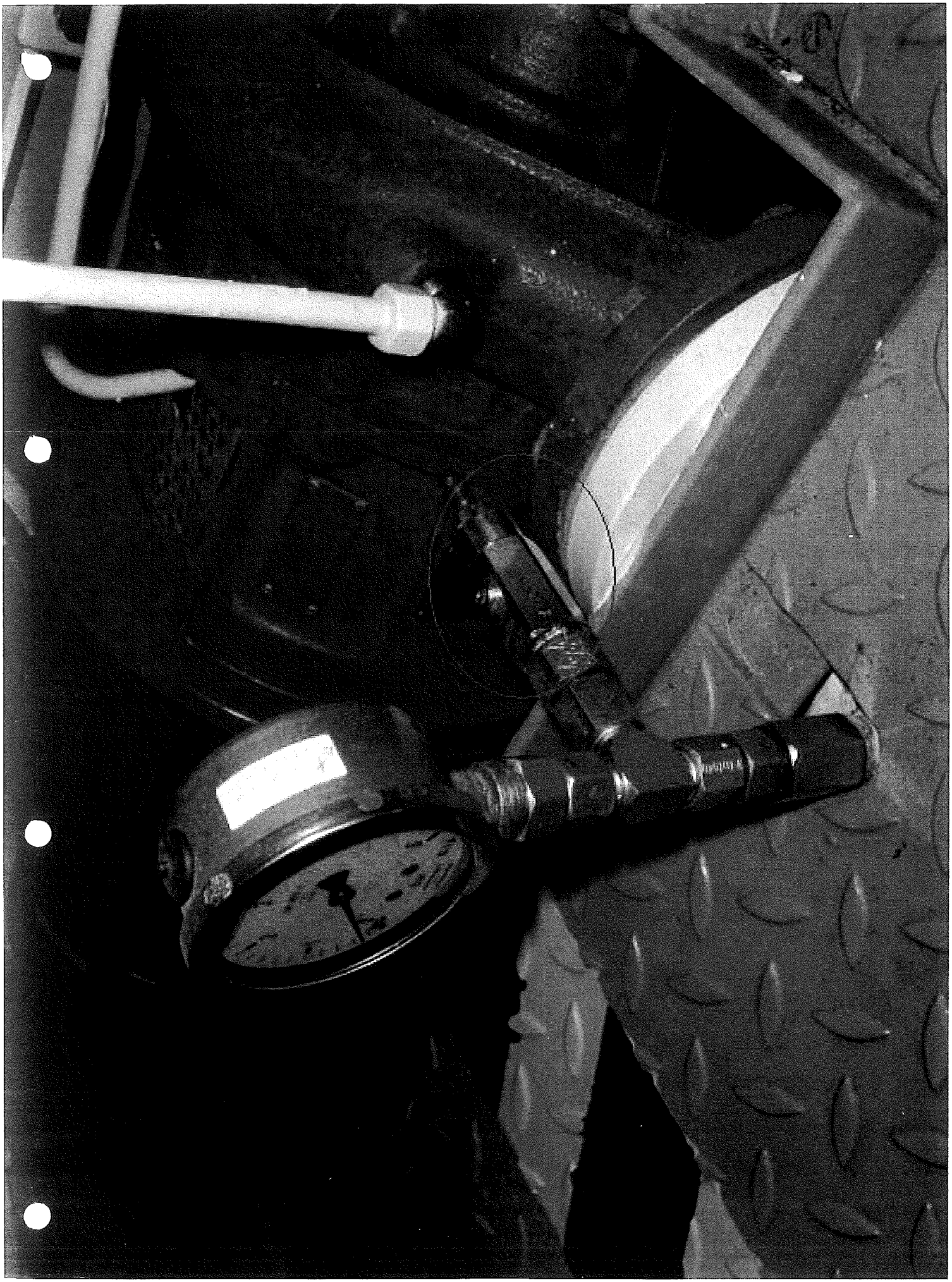
This section is confined to identifying sampling points

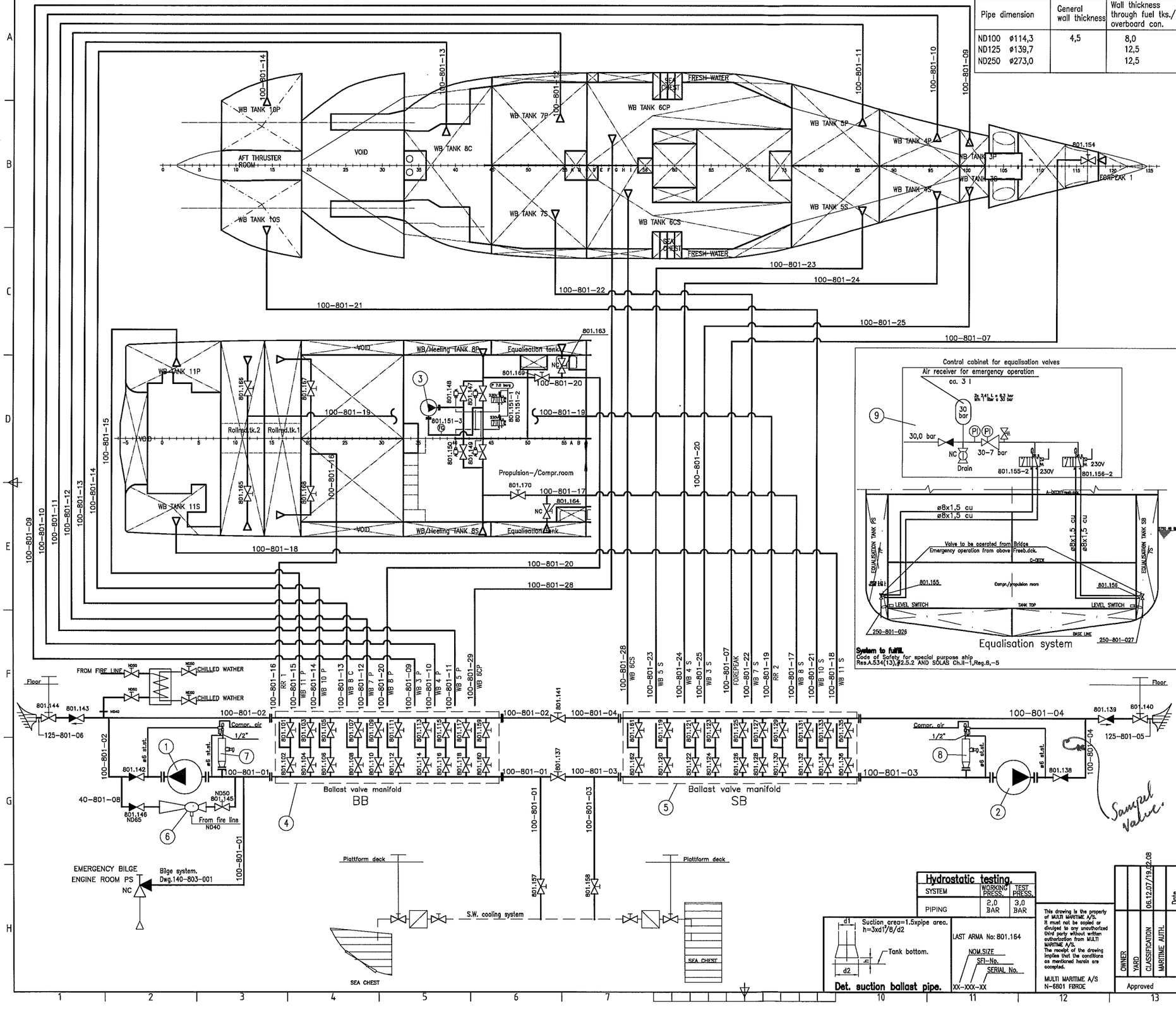
There is unlikely to be any need for crewmembers to take samples except at the express request, and under the supervision, of a quarantine officer.

The lists or diagrams below indicate sampling and access points in pipelines and tanks, so that crewmembers can quickly assist quarantine officers who wish to obtain samples.

Quarantine officers must be advised of all safety procedures to be observed when entering enclosed spaces.

See drawing 141803101





Wall thickness for Ballast pipes

Pipe dimension	General wall thickness	Wall thickness through fuel tks./ overboard con.
ND100 ø114,3	4,5	8,0
ND125 ø139,7		12,5
ND250 ø273,0		12,5

PIPE LIST

Pipe	Norm. Dia.	Pipe dim. Gen.	Pipe dim. in tanks	Material	Remarks
100-801-01	100	ø114,3x4,5		Galv.st.	
100-801-02	100	ø114,3x4,5		Galv.st.	
100-801-03	100	ø114,3x4,5		Galv.st.	
100-801-04	100	ø114,3x4,5		Galv.st.	
125-801-05	125	ø139,7x12,5	ø139,7x12,5	Galv.st.	Pipe between hull plating and valve.
125-801-06	125	ø139,7x12,5	ø139,7x12,5	Galv.st.	Pipe between hull plating and valve.
100-801-07	100	ø114,3x4,5		Galv.st.	
40-801-08	40	ø48,3x4,5		Galv.st.	
100-801-09	100	ø114,3x4,5		Galv.st.	
100-801-10	100	ø114,3x4,5		Galv.st.	
100-801-11	100	ø114,3x4,5		Galv.st.	
100-801-12	100	ø114,3x4,5		Galv.st.	
100-801-13	100	ø114,3x4,5		Galv.st.	
100-801-14	100	ø114,3x4,5		Galv.st.	
100-801-15	100	ø114,3x4,5		Galv.st.	
100-801-16	100	ø114,3x4,5		Galv.st.	
100-801-17	100	ø114,3x4,5		Galv.st.	
100-801-18	100	ø114,3x4,5		Galv.st.	
100-801-19	100	ø114,3x4,5		Galv.st.	
100-801-20	100	ø114,3x4,5		Galv.st.	
100-801-21	100	ø114,3x4,5		Galv.st.	
100-801-22	100	ø114,3x4,5		Galv.st.	
100-801-23	100	ø114,3x4,5		Galv.st.	
100-801-24	100	ø114,3x4,5		Galv.st.	
100-801-25	100	ø114,3x4,5		Galv.st.	
250-801-26	250	ø273x6,3	ø273x12,5	Galv.st.	Pipe between hull plating and valve.
250-801-27	250	ø273x6,3	ø273x12,5	Galv.st.	Pipe between hull plating and valve.
100-801-28	100	ø114,3x4,5		Galv.st.	
100-801-29	100	ø114,3x4,5		Galv.st.	

EQUIPMENT LIST

Pos no.	Item no.	Description.	Make/Type.	Capacity	Remarks
1	801.001	Ballast pump I	Centr. Saltyrining	100 m3/h-2,0 bar	
2	801.002	Ballast pump II	Centr. Saltyrining	100 m3/h-2,0 bar	
3	801.003	Heeling pump	Centr. Saltyrining	100 m3/h-2,0 bar	
4	801.011	Valve chest I	8 cells	ND100/ND100	
5	801.012	Valve chest II	9 cells	ND100/ND100	
6	801.005	Stripping ejector		2,0 m3/h	
7	801.013	Air evacuation unit			Yard standard
8	801.014	Air evacuation unit			Yard standard
9	801.015	Control cabinet equal. valves			

DESCRIPTION OF SYMBOLS

Symbol.	Description.	Symbol.	Description.	Symbol.	Description.
	Buterfly valve		Reducer	FG	Flow guard (1" socket)
	Non return Screw down	NC	NC=normally closed Signboard to be fitted	LH LL	Level alarm
	Non return check valve	TI PI	Temp./Pres. indicate		Suction strum
	Stop valve		Remote operated Electric/Solenoid		Centrifugal pump
	Filter		Remote operated Pneumatic		Screw pump

REF. DRAWINGS:

- Bilge system: 141803001
- Sea water cooling system: 141720001

NOTES:

- Steel pipes shall be hot galv. acc. to ISO 1461 after prefab.
- Pipes shall be properly flushed, cleaned and tested according to DnV Rules Pt. 4 Ch. 6, Sec.7.
- Armatures are listed in separate document "801-Amature List"

CLASS:

DNV +1A1,ICE-C,E0,RP,DYNPOS-AUTR,HELDK-SH

Hydrostatic testing.

SYSTEM	WORKING PRESS.	TEST PRESS.
PIPING	2,0 BAR	3,0 BAR

MULTI MARITIME A/S
N-6801 FØRDE

OWNER | YARD | CLASSIFICATION | MARITIME AUTH. — Approved 06.12.07/19.12.08

REV.NO.	REVISION	DATE	APPR
2a	Update acc BN140	20.01.09	KnV
2	Appr. DnV	22.02.08	OS
1	Connection to Equalisation tanks added.	08.01.08	OS
0	Suct. in R.R.-tanks revised. Appr. DnV. Issued for production	07.01.08	OS
A	Issued for approval	16.11.07	GEH

VAAGLAND
VAAGLAND BATBYGGERI AS 6583 VAGLAND NORWAY
Phone 47 71559900
Telefax 47 71559901
E-mail vaagland@vaagland.no

YARD NO. 141

TITLE: **Ballast system**

SCALE 1:1 | DRAWN OL 23.10.07 | CK'D | APPR.

MULTI MARITIME
MULTI MARITIME AS
P.O.Box 90, N-6801 FØRDE
Phone 47 57823000
Telefax 47 57828451
E-mail: firmapost@multi-maritime.no

PROJECT NO. 260/6 | SFI 801 | FILE NAME / DRAWING NO. 141801001-2 | REV.NO. 2b

5. PROCEDURES FOR EXCHANGES OF BALLAST WATER

5.1 BWE method selected for this vessel

The flow through method i.e. the ballast pump is running three times of calculation time for complete charge or discharge.

A ballast handling plan for a ballast voyage should be prepared in advance, in a similar manner to the preparation of a cargo plan for a loaded voyage, and with the same degree of thoroughness. This preplanning is necessary in order to maintain safety in case compliance with ballast exchange or other ballast water treatment or control options is required.

The safety information in Section 4 should be taken into account when preparing the voyage plan.

This section gives guidance on ballast handling procedures to be followed at sea.

If there are no safe options, either under all circumstances or in certain conditions, the restrictions should be stated here. Such a statement will assist a master when responding to enquiries from a quarantine officer.

INFORMING SHORE MANAGEMENT

All ballast management will be logged in Ballast Water handling Log. Shore management should be informed if special events concerning ballast water occur.

SEDIMENT REMOVAL OR REDUCTION

Where practical, cleaning of the ballast tanks to remove sediments should be undertaken.
Ballast tanks to be cleaned according to maintenance plan onboard – TM Master. Or more often if suspicion of special sedimentary ballast water.

RETENTION OF BALLAST ON BOARD

All retention on ballast must be logged in Ballast water log. (See form in chapter 9).

WATER TREATMENT

If necessary it should be used Bio control chemicals for water treatment.
Example: Unitor product MAR-71, or Bioguard.
As pr. today there is no product that fully complies with sufficient water treatment.

EXCHANGE AT SEA

On occasions of longer voyages, the vessel will exchange all water ballast at minimum of 200n.m range from shore and in water at least 200m in depth.

5.2 Flow-through Method

5.2.1 General

The flow-through method, whereby tanks are overfilled by pumping in additional water, has the advantage that it can be used in weather conditions which would be marginal for use of the sequential method, since there is little change to the condition of the ship.

Research has established that it is necessary to pump in *tree tomes the volum* of the tank to achieve a 95 % change of water. For the record, pumping in only once the volume of the tank produces at 63 % exchange; twice the volume produced 86 % exchange, while for times the volume produced a 98% water exchange.

5.3.2 Items of considerations

However, the flow-through method introduces certain other risks and problems which must be considered before using this procedure. Refer also to, "Safety Considerations". Given in 5.3.. In addition, note the items listed below.

- All openings used as outflow for the water should be inspected prior to start, to check that the water may flow freely out. Any flame screens fitted to air vent heads are to be removed. It should be ensured that no more pump pressure is applied on the tanks than can be handled by the over-flow of water through the opening.
- The necessary pump running time to be based on the pump flow characteristic, pipe dimensions, and air pipe head type, as well as loading condition.
- Preferably one pump should pump through one tank to get full control of the exchange.
- When pumping through more than one tank at the same time with the same pump(s), the system resistance must be equal to secure the same degree if exchange for all tanks. Openings from which the water flows out must be of the same shape and size and at the same vertical level.
- The ship`s normal procedure for use of the ballast system should be followed.
- The free flow of water through the opening should be visually checked at regular intervals.
- At any time, if the responsible officer find it necessary taking account of the ship`s position, weather forecast, machinery performance and degree of crew fatigue or any other factor is considered unfavorable the ballast exchange should be suspected or halt.
- If, for some reason, the tank is not full before an exchange take place, the filling up of the tank will change the loading condition. Prior to this, the condition with a full tank should be checked on the ship`s loading computer for compliance with the strength limits.

- Do not use more than one pump on any single tank.

- It is necessary prior to this operation to open the wathertight manholes/hatches of the corresponding tank (OR to remove the ventheads from the overflow pipes) in order to avoid increasing the pressure to valves higher than what the tank is structurally verified for. It is the responsibility of the Ballast Water Management Officer to ensure that these are re- secured after completion of the operation.

5.2.3 Calculation tank pressure and time consumption

The below table contains all tanks for witch the flow through method is approved/recommended.

Ballast pump capacity: 100 m3/h

No	Name	Net. Vol m3	3x Volume m3	Assumed design limit for dynamic pressure (mWC)	Calculated dynamic pressure (mWC)	Time consumption.3x volume using 1 ballast pump
1	Forepeak Tk. WBT	66,7	200,1	2,5	2,82	2h 0,6 min
2	WB 3 P	82,9	248,7	2,5	2,82	2h 29 min
3	WB 3 S	82,9	248,7	2,5	2,82	2h 29 min
4	WB 4 P	73,0	219	2,5	2,82	2h 11 min
5	WB 4 S	73,0	219	2,5	2,82	2h 11 min
6	WB 5 P	90,6	271,8	2,5	2,82	2h 43 min
7	WB 5 S	90,6	271,8	2,5	2,82	2h 43 min
8	WB 6 CP	71,0	213	2,5	2,78	2h 8 min
9	WB 6 CS	69,4	208,2	2,5	2,78	2h 5 min
10	WB 7 CP	53,2	159,6	2,5	3,09	1h 36 min
11	WB 7 CS	53,2	159,6	2,5	3,02	1h 36 min
12	WB 8 P HEELING	51,8	155,4	2,5	1,35	1h 33 min
13	WB 8 S HEELING	51,8	155,4	2,5	1,35	1h 33 min
14	WB 8 C	51,1	153,3	2,5	1,98	1h 32min
15	WB 10 P	37,9	113,7	2,5	2,89	1h 8min
16	WB 10 S	37,9	113,7	2,5	2,89	1h 8min
17	WB 11 P	60,1	180,3	2,5	1,35	1h 48 min
18	WB 11 S	51,4	154,2	2,5	2,79	1h 32 min
19	22 ROLL RED 1	131,8	395,4	2,5	2,25	3h 58min
20	23 ROLL RED 2	161.3	483,9	2,5	2,91	4h 51 min
	TOTAL	1441,6				

5.3.4 Type of vent valves

Vent valves w/flame screen AERO 1,2 (Angular)

Dimension	pressure	Tank no
ND 125	0,275	WB 1 FOREP
ND 125	0,275	WB 3 PS
ND 125	0,275	WB 3 SB
ND 125	0,275	WB 4 PS
ND 125	0,275	WB 4 SB
ND 125	0,275	WB 5 PS
ND 125	0,275	WB 5 SB
ND 125	0,275	WB 7 PS
ND 125	0,275	WB 7 SB
ND 125	0,275	WB 10SB
ND 125	0,275	WB 11 PS
ND 125	0,275	WB 6 CS
ND 125	0,275	WB 6 CP

Vent valves w/flame screen AERO 1,1 (Straight)

Dimension	pressure	Tank no
ND 125	0,130	WB /HEEL 8 PS
ND 125	0,130	WB /HEEL 9 SB
ND 125	0,130	WB 11 SB

Vent valves without /flame screen AERO 1,1 (Straight)

Dimension	pressure	Tank no
ND 125	0,162	RR Tk 22 PS
ND 125	0,162	RR Tk,23 PS
ND 125	0,162	RR Tk.23 SB
ND 125	0,162	WB 8C.PS
ND 125	0,162	WB 8C SB

Vent valves without /flame screen AERO 1,2 (Angular)

Dimension	pressure	Tank no
ND 125	0,228	RR Tk 22 SB

Safety issues related to the Flow-through Method

The parameters used when the ship is designed always take account of storm conditions and the water on deck which results. Therefore, even at maximum pumping rates, any accumulation of water on deck will be insufficient to affect stability.

Research has established that it is necessary to pump in three times the volume of the tank to achieve a 95% change of water. For the record, pumping in only once the volume of the tank produces a 63% exchange; twice the volume produces 86% exchange, while four times the volume produces a 98% water exchange.

The table below shows the time needed for the required amount of water to be pumped into each ballast tank to achieve the desired percentage change of water, and the pumps to be used.

A step by step procedure follows, listing the order in which tanks are to be processed.

After each step, a positive decision should be made, taking account of the ship's position, weather forecast, machinery performance and degree of crew fatigue, before proceeding to the next step. If any factors are considered unfavorable the ballast exchange should be suspended or halted.

6. SAFETY – GENERAL CONSIDERATIONS

6.1 General

In his chapter a number of safety aspects are listed. Not all will be relevant for this vessel/ballast water exchange (BWE) method selected. Witch aspect(s) is/are important depends upon the arrangement, construction, size, ect.

The weather is often a critical parameter. It is not easy to give clear limitations with respect to the weather in witch vessel can undertake exchange of ballast water. The potential hazards will increase with increasing waves, but also be dependent on the ships speed and heading (for instance, bottom slamming is only a problem in head seas.) The judgment of the weather conditions in connection with ballast water exchange will to a large extent have to be based on the master`s experience with the vessel.
It is the duty of the ballast operation responsible officer together with the ships`s master to evaluate the risk and decide if the BWE shall be executed or not.

6.2 Potential hazards connection to ballast exchange in open sea

- **Related to** weather.
  - Rough sea: **Bottom slamming** in fore ship, causing structural damage. This is dependent on the draught forward, and the vessel heading. If slamming is experienced during emptying of some of the tanks, it is possible to stop /reduce this by temporarily altering the vessels heading or reducing the speed.
    Sloshing in tanks, causing reflection/damage to internal tank structure.
  - Strong wind: Depends upon the wind direction. If the BWE involves steps witch cause that the vessel can not keep upright condition all the time or reduced GM, side wind may contribute to heel/rool. Static heel should be max 2 degree preferably
  - Low temperatures in witch icing in the ballast tanks may occur Clogging, ice-plugs or malfunctioning of air vent heads may lead to structural damage to tanks.
  - **Crew safety,** if BWE requires manual deck operations.

- **Related to** *internal loads*
  - *Exceed permissible maximum allowable limits with respect to longitudinal strength (shear force and banding moment).This could cause damage even in good weather condition, and the stresses increase with increasing waves. All new conditions not previous calculated should be checked on the vessel loading computer, for each step in the exchange sequence.*
  - Loss of ***stability.*** As emptying of ballast tanks often results in free surface effects and increased VCG, there should always be included a sufficient safety margin in the internal conditions.

- **Related to the vessel`s** *operation.*

Loss of ***visibility.*** *The view of the sea surface in front of the vessel will be temporarily reduced, due to decreasing draught and increased aft trim.SOLAS-74/96 amendment ,Ch,Y,Reg.2 requires that this view shall not be obscured by more than two ship lengths, or 500 m, whichever is the less, forward of the bow to 10 degrees on either side under all conditions of draught, trim and deck cargo.*
-pump and piping system.
Tables or necessary data to calculate the invisible zone will be available in the Trim -and stability Manual.

- Less propeller immersion. If the draught is reduced aft, the propeller may not be sufficient submerges.

- Less rudder immersion. By reducing the draught aft, the rudder will also become less immersed, witch may reduced the maneuvering capability some.

Related to the vessel`s *pump and piping system.*

- **System failure.** Failure of the system in open sea may have larger consequence than in harbour. Increased use of the ballast system for ballast water exchange may result in earlier wear- out of components than normal.(vents valves, pumps, gauges, etc) It is therefore important to pay extra attention to the maintenance of the different components.

Over/under pressure of tanks, leading to structural damage During filling/emptying of each of the tanks, one should avoid over-pumping through air pipes when tanks are being filled, unless it has been verified that the tank design pressure is not exceeded during such operations and corresponding filling procedures are adhered to. See also 73.3. as applicable. It should also be checked that the venting system is functioning properly.

7. OFFICER AND CREW RESPONSIBILITY AND TRAINING

The officers and crew involved in ballast water management should study this report and the enclosure IMO Res MEPC.127 (53), and familiarize themselves with the following.

- the background for the need for ballast water exchange
- the requirements to ballast water management for the relevant arrival ports.
- the safety consideration in connection with ballast water exchange
- the location of the ballast water sampling points of the ship
- precautions for entering tanks for sediment removal
- ballast water record book and maintaining of records.

It is important that the crew involves with ballast water management will get the sufficient training w.r.t their relevant tasks. Especially focus should be on the part concerning the accurate ballast exchange, since this operations may directly influence on the vessels safety if conducted incorrectly.

7.1 Training for ships' masters and crews as appropriate should include instructions on the application of ballast water and sediment management and treatment procedures, based upon the information contained in these Guidelines. Instruction should also be provided on the maintenance of appropriate records and logs. Governments should ensure that their marine training organizations include this in the contents of their syllabus.

7.2 The application of processes and procedures concerning ballast water management are currently at the core of the solution to minimize the introduction of harmful aquatic organisms and pathogens.

7.3 Governments are encouraged to include knowledge of duties regarding the control of pollution of the sea by harmful aquatic organisms and pathogens in their training requirements for certificates.

M/V Sanco Spirit are supplied with the Seagull "Ballast Water Management" Computer Based program according to IMO Res. MEPC 127(53)

All relevant information about ballast must be included on Chief Officer's handover. Ballast water management must also be a natural part of the familiarization of new deck officers.

8. DUTIES OF APPOINTED BALLAST WATER MANAGEMENT OFFICER

Appointed Ballast Water Management Officer
[THE CHIEF OFFICER]

Duties of the appointed officer in charge of ballast water management:

1. Obtain information on the requirements of the port authorities of the next visiting port in due time before arrival in those waters.

2. In corporation with the master of the vessel, decide whether exchange of ballast water should be undertaken.

3. Ensure that the ballast water exchange, if applicable, follows procedures in the ballast water management plan.

4. If required, prepare and fax the ballast water declaration form prior to arrival in port.

5. Be available to assist the port state control or quarantine officers for any sampling that may need to be undertaken.

6. Clean Ballast tanks according to maintenance program.

7. Maintain the ballast water handling log.

9. BALLAST WATER REPORTING FORM AND HANDLING LOG

9.1. Format for ballast water reporting form

Guidelines for completing the form follows on the page opposite

This form is an example developed in IMO, to serve as a guide for use when reporting to a national authority that requests information in advance. To avoid misunderstandings, some guidance for completing it follow on the page opposite. It should be noted that question 3, "Total number of tanks on board" refers only to the total number of segregated ballast tanks.

Care should be taken before using this general form, since the country being approached may have its own form for use for reporting.

> As explained in Section 2, it may be found convenient to pre-format all reporting forms to contain permanent information such as ship's name, IMO number, total number of tanks on board, total ballast capacity, etc.. The list of tanks can be tailored to match the ship exactly. This will help to avoid inadvertent errors, and the clarity of presentation will be welcome to quarantine officers.

9.2. Format for ballast water handling log

Record of loading and discharging ballast

Narrative pages for recording unusual events

These two forms have been created as a guide for recording the sort of information often requested by quarantine officers who wish to learn about the source of the ballast water on board.

Even if the ship is not currently trading in an area where ballast water information is required to be reported, it may later prove worthwhile to have a history of what water has been carried.

BALLAST WATER REPORTING FORM

(To be provided to the Port State Authority upon request)

1. SHIP INFORMATION

2. BALLAST WATER

Ship's Name: Sanco Spirit	Type: Seismic Survey Vessel	IMO Number: 9429936	Specify Units: M^3, MT, LT, ST M^3
Owner: Sanco Holding A/S	Gross Tonnage: 4053	Call Sign: ZDIT8	Total Ballast Water on Board:
Flag: Gibraltar	Arrival Date:	Agent:	
Last Port and Country:		Arrival Port:	Total Ballast Water Capacity: 1441,6m3
Next Port and Country:			

3. BALLAST WATER TANKS Ballast Water Management Plan on board? YES NO Management Plan Implemented? YES NO

Total number of ballast tanks on board: ____20_____ No. of tanks in ballast: _____ IF NONE IN BALLAST GO TO No. 5.

No. of tanks exchanged: _____ No. of tanks not exchanged: _____

4. BALLAST WATER HISTORY: RECORD ALL TANKS THAT WILL BE DEBALLASTED IN PORT STATE OF ARRIVAL; IF NONE GO TO No. 5.

Tanks/ Holds (List multiple sources per tank separately)	BALLAST WATER SOURCE				BALLAST WATER EXCHANGE Circle one: Empty/Refill or Flow Through					BALLAST WATER DISCHARGE			
	DATE DDMMYY	Port or Lat/Long	Volume (units)	Temp (units)	DATE DDMMYY	Endpoint Lat/Long.	Volume (units)	% Exch.	Sea Hgt. (m)	DATE DDMMYY	Port or Lat/Long	Volume (units)	Salinity (units)

Ballast Water Tank Codes: Forepeak = FP, Aftpeak = AP; Double Bottom = DB; Wing = WT; Topside = TS; Cargo Hold = CH; Other = O

IF EXCHANGES WERE NOT CONDUCTED, STATE OTHER CONTROL ACTION(S) TAKEN:_____

IF NONE STATE REASON WHY NOT:_____

5: IMO BALLAST WATER GUIDELINES ON BOARD (RES. MEPC 127(53)) YES NO

RESPONSIBLE OFFICER'S NAME AND TITLE (PRINTED) AND SIGNATURE: _____

GUIDELINES FOR COMPLETING THE BALLAST WATER REPORTING FORM

SECTION 1: SHIP INFORMATION

Ship's Name: Print the name of the ship.
Owner: The registered owners or operators of the ship.
Flag: Country of the port of registry.
Last port and country: Last port and country at which the ship called before arrival in the current port - no abbreviations, please.
Next port and country: Next port and country at which the ship will call, upon departure from the current port - no abbreviations, please.
Type: The ship type is .....
GT: Gross tonnage.
Arrival Date: Arrival date at current port. Please use the European date format (DDMMYY)
IMO Number: Identification number of the ship used by the International Maritime Organization is .....
Call Sign: Official call sign is .....
Agent: Agent used for this voyage.
Arrival Port: This is the current port.
No abbreviations, please.

SECTION 2: BALLAST WATER

(Note: Segregated ballast water = clean, non-oily ballast)

Total ballast water on board: Total segregated ballast water upon arrival at current port - with units.
Total ballast water capacity: Total volume of all ballast able tanks or holds - with units.

SECTION 3: BALLAST WATER TANKS

Count all tanks and holds separately (e.g. port and starboard tanks should be counted separately)

Total No. of Tanks on board: ( ) tanks and holds can carry segregated ballast water.

Ballast Water Management Plan on board?: Do you have a ballast water management plan, specific to your ship, onboard? Circle Yes or No.
Management Plan Implemented?: Do you follow the above plan? Circle Yes or No.
No. of Tanks in Ballast: Number of segregated ballast water tanks and holds with ballast at the start of the voyage to the current port. If you have no ballast water on board, go to section 5.
No. of Tanks Exchanged: This refers only to tanks and holds with ballast at the start of the voyage to the current port.
No. of Tanks Not Exchanged: This refers only to tanks and holds with ballast at the start of the voyage to the current port.

SECTION 4: BALLAST WATER HISTORY

BW Source: Please list all tanks and holds that you have discharged or plan to discharge in this port. Carefully write out, or use codes listed below the table. Follow each tank across the page, listing all source(s), exchange events, and/or discharge events separately. If the ballast water history is identical (i.e. the same source, exchange and discharge dates and locations), sets of tanks can be combined (example: wing tank 1 with wing tank 2, both water from Belgium, exchanged 02.11.97, mid ocean).
Additional pages to include the arrival date, ship's name and IMO number at the top.
Date: Date of ballast water uptake. Use European format (DDMMYY).
Port or Latitude/Longitude: Location of ballast water uptake.
Volume: Volume of ballast water uptake, with units.
Temperature: Water temperature at time of ballast water uptake, in degrees centigrade (Celsius).

BW Exchange: Indicate Exchange Method: Circle empty/refill or flow through.
Date: Date of ballast water exchange. Use European format (DDMMYY).

Endpoint or Latitude/Longitude: Location of ballast water exchange. If it occurred over an extended distance, list the end point latitude and longitude.
Volume: Volume of ballast water exchanged, with units.
Percentage exchanged: Percentage of ballast water exchanged. Calculate this by dividing the number of units of water exchanged by the original volume of ballast water in the tank. If necessary, estimate this based on pump rate. (Note: For effective flowthrough exchange this value should be at least 300%).
Sea Height (m): Record the sea height in metres at the time of the ballast exchange (Note: this is the combined height of the wind seas and swell, measured from crest to trough. It does not refer to the depth).

BW Discharge:
Date: Date of ballast water discharge. Use European format (DDMMYY).
Port or Latitude/Longitude: Location of ballast water discharge, no abbreviations for ports.
Volume: Volume of ballast water discharged, with units.
Salinity: Record salinity of ballast water at the time of discharge, with units, (i.e. specific gravity (sg) or parts per thousand (ppt)).
If exchanges were not conducted, state other control action(s) taken: If exchanges were not made on all tanks and holds to be discharged, what other actions were taken? E.g. transfer of water to a land based holding facility, or other approved treatment.
If none, state reasons why not: List specific reasons why ballast exchange was not done. This applies to all tanks and holds being discharged.

SECTION 5:
IMO Ballast Water Guidelines On Board?: Do you have IMO Resolution A.868(20) on board your ship? Circle Yes or No.
Responsible Officer's name and title (Printed) and signature: e.g. the First Mate, Captain, or Chief

Engineer must print his name and title and sign the form.

Ballast water Handling log

Record of ballast water management onboard

Month: **Year:** Rev. 1

Vessel: **Sanco Spirit** Call Sign: **ZDJN3** IMO Nr: **9429936** Port of Registry: **Gibralta r**

TANK LOCATION	DATE	INITIAL CONTENT (tonnes)	FINAL CONTENT (tonnes)	GEOGRAPHIC LOCATION OF SHIP (Port or Lat. & Long.)	PUMPS USED, or GRAVITATE	DURATION OF OPERATION	SALINITY	NAME OF OFFICER IN CHARGE	RANK
FP									
3P									
3S									
4P									
4S									
5P									
5S									
6 CP									
5 CS									
7CP									
7CS									
8P.Heeling									
8S.Heeling									
8C									

10P									
10S									
11P									
11S									
22Roll Red 1									
23Roll Red 2									

BALLAST WATER HANDLING LOG

Narrative record of events related to ballast water management on board

M/V Sanco Spirit..... Port of Registry :**Gibraltar**..... ..... IMO number ..**94299336**.....

Record here events which are relevant to ballast management, and which will be of interest to quarantine officers, such as sediment removal during dry-dock, or tank flushing at sea. Each entry should be completed with the signature and rank of the officer making the entry.

Date	Activity	Comments

Appendix 2. Garbage Management Plan

GMP

GARBAGE MANAGEMENT PLAN

M/S “Sanco Spirit”

This manual is:	**CONTROLLED**
Name/Pos. of holder:	**M/S Sanco Spirit**
Copy No:	**5**
Prepared by:	**Geir Stormbringer**

Document Title: Revision Status and Instruction	**Sanco Shipping AS**	Approved By: General Manager Reviewed By: SQAG
Revision: 00		Issue Date: 10.08.09
Document ID: A.01	**Document Type: Revision**	Effective Date: 02.09.09

Manual Title and Holder

Manual Title	Manual number	Custodian (position)
Garbage Management Plan	5	M/S SANCO SPIRIT

Revision Instructions

Rev. no	Date Eff.	Doc. Title	Doc. ID	Description of Revision Instructions	Page(s) added	Page(s) deleted

Revision Authorisation and History

Rev No	Date Effective	Prepared by	Reviewed by	Authorised by	Signed by

AUTHORIZATION

The Garbage Management Plan is authorized for use on board all vessels owned and/or managed by Sanco Shipping AS.

The manual contains the authorized governing guidelines for the carrying out of Vessel's garbage procedures for Sanco Shipping AS.
The manual is applicable for waters world wide..

The Guidelines is based on Sanco Shipping AS's goals, strategies, values and management principles, and covers the requirements of the quality manual.

Gjerdsvika 02.09.09

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SQAG

Doc.No.	Title	Rev.no	Date
	A.GENERAL		
A.01	Revision Status	0	10/8-09
A.02	Authorization	0	12/8-09
A.03	Table of content	0	10/8-09
A.04	Definition	0	10/8-09
A.05	Foreword	0	10/8-09
A.06	Introduction	0	10/8-09
A.07	Ships data	0	10/8-09
	B.REGULATORY REQUIREMENTS		
B.01	General	0	10/8-09
B.02	Special areas	0	10/8-09
	C.PREVENTION OF POLLUTION FROM GARBAGE		
C.01	General	0	10/8-09
C.02	Source reduction	0	10/8-09
C.03	Recycling	0	10/8-09
	D.GARBAGE MANAGEMENT PROCEDURES		
D.01	Management policy	0	10/8-09
D.02	Training	0	10/8-09
D.03	Designated person	0	10/8-09
D.04	Procedures for collecting garbage	0	10/8-09
D.05	Garbage Categories	0	10/8-09
D.06	Procedures for processing garbage	0	10/8-09
D.07	Procedures for storing garbage	0	16/8-09
D.08	Procedures for disposing of garbage	0	10/8-09
D.09	Record keeping	0	10/8-09

APPENDIX 1 Garbage record book

APPENDIX 2 Receipt for garbage landed ashore

APPENDIX 3 Reporting Inadequacy of port reception facilities

Definitions

Ash and clinkers from shipboard incinerators and coal burning boilers are operational wastes in the meaning of Annex V regulation 1(1), and are therefore included in the term all other garbage in the meaning of Annex V, regulations 3(1)(B)(II) and 5(2)(A)(II).

Cargo-associated waste means air materials which have become wastes as a result of use on board a ship for cargo stowage and handling. Cargo-associated waste includes but is not limited to dunnage, shoring, pallets, lining and packing materials, plywood, paper, cardboard, wire, and steel strapping.

Cargo residues for the purposes of these Guidelines are defined as the remnants of any cargo material on board that cannot be placed in proper cargo holds (loading excess and spillage) or which remain in cargo holds and elsewhere after unloading procedures are completed (unloading residual and spillage). However, cargo residues are expected to be in small quantities.

Cargo residues are to be treated as garbage under Annex V except when those residues are substances defined or listed under the other annexes to the Convention.

Cargo residues of all other substances are not explicitly excluded from disposal as garbage under the overall definition of garbage in Annex V. However, certain of these substances may pose harm to the marine environment and may not be suitable for disposal at reception facilities equipped to handle general garbage because of their possible safety hazards. The disposal of such cargo residues should be based on the physical, chemical and biological properties of the substance and may require special handling not normally provided by garbage reception facilities.

Discharge, in relation to harmful substances or effluents containing such substances, means any release, howsoever caused, from a ship and includes any escape, disposal, spilling, leaking, pumping, emitting or emptying.
Discharge does not include;

(I) dumping, within the meaning of the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, done at London on 13 November 1972; or
(II) release of harmful substances directly arising from the exploration, exploitation and associated offshore processing of sea-bed mineral resources; or
(III) release of harmful substances for purposes of legitimate scientific research into pollution abatement or control.

Dishwater is the residue from the manual or automatic washing of dishes and cooking utensils which have been pre-cleaned to the extent that any food particles adhering to them would not normally interfere with the operation of automatic dishwashers.

Greywater is drainage from dishwater, shower, laundry, bath and washbasin drains and does not include drainage from toilets, urinals, hospitals and animal spaces, as defined in regulation 1(3) of

Annex IV, as well as drainage from cargo spaces. Dishwater and greywater are not included as garbage in the context of Annex V.

Domestic waste means all types of food wastes and wastes generated in the living spaces on board the ship.

Food wastes are any spoiled or unspoiled victual substances, such as fruits, vegetables, dairy products, poultry, meat products, food scraps, food particles, and all other materials contaminated by such wastes, generated aboard ship, principally in the galley and dining areas. The release of small quantities of food wastes for the specific purpose offish feeding in connection with fishing or tourist operations is not included as garbage in the context of Annex V.

Harmful substance means any substance which, if introduced into the sea, is liable to create hazards to human health, harm living resources and marine life, damage amenities or interfere with other legitimate uses of the sea, and includes any substance subject to control by the Convention.

Maintenance waste means materials collected by the engine department and the deck department while maintaining and operating the vessel, such as soot, machinery deposits, scraped paint, deck sweepings, wiping wastes and rags etc.

Oily or contaminated rags are rags which have been saturated with oil as controlled in Annex I to the Convention, or which have been saturated with a substance defined as a harmful substance in the other annexes to the Convention.

Operational wastes means all cargo-associated waste and maintenance waste, and cargo residues defined as garbage.

Plastic means a solid material which contains as an essential ingredient one or more synthetic organic high polymers and which is formed (shaped) during either manufacture of the polymer or the fabrication into a finished product by heat and/or pressure. Plastics have material properties ranging from hard and brittle to soft and elastic. Plastics are used for a variety of marine purposes including, Out not limited to, packaging (vapour-proof barriers, bottles, containers, liners), ship construction (fibreglass and laminated structures, siding, piping, insulation, flooring, carpets, fabrics, paints and finishes, adhesives, electrical and electronic components), disposable eating utensils and cups, hags, sheeting, floats, fishing nets, strapping bands, rope and line.

Wastes means useless, unneeded or superfluous matter which is to be discarded.

FOREWORD

The International Convention for the Prevention of Pollution from Ships (MARPOL 73/78) covers six categories of marine pollution. Annex V, which entered into force on 31 December 2008, concerns garbage which is defined in the Convention as follows;

Garbage means all kinds of victual domestic and operational waste excluding fresh fish and parts thereof generated during the normal operation of the ship and liable to be disposed of continuously or periodically except those substances which are defined or listed in other Annexes to the present Convention.

Amendments to Annex V of MARPOL 73/78 were adopted in 1995, requiring ships of 400 gross tons and over and all ships certified to carry 15 or more persons to have a Garbage Management Plan and a Garbage Record Book. In addition, the amendments require every ship of 12 meters or more in length to display placards to notify the crew and passengers of the rules governing the disposal of garbage. The new regulations entered into force on 1 July 1997 for new ships, and apply to ships built before that date from 1 July 1998.

In July 1996 the Marine Environment Protection Committee (MEPC) of the International Maritime Organization (IMO) adopted a resolution MEPC 71(38) containing 'Guidelines for the Development of Garbage Management Plans.

Against that regulatory background this publication have been produced.
In addition to the provisions of MARPOL Annex V, and the guidelines annexed to resolution MEPC 71(38), the contents of the following requirements and recommendations issued by IMO have also been taken into account;

- Guidelines for the Implementation of Annex V of MARPOL 73/78 - 1997 Edition

- International Safety Management Code (ISM Code) - 1997 Edition

- Procedures for Port State Control - 1997 Edition

Use has also been made of helpful information contained in other documents provided to IMO on the subject.

MARPOL Annex V are the absolute prohibition on the disposal of plastics at sea, severe restrictions on the distance from the nearest land that other types of ship-generated garbage may be discharged, and the creation of designated 'Special Areas'.

To assist vessel operators and other interested parties comply with the requirements of MARPOL Annex V the IMO document 'Guidelines for the Implementation of Annex V of MARPOL 73/78' includes advice on minimizing the amount of potential garbage, on handling and storage procedures, and on shipboard equipment for processing garbage.

Reception facilities

The quality and availability of reception facilities world-wide is not consistent.
Some developing countries nave been helped by regional initiatives and programs to provide adequate facilities, while some developed countries provide poorer facilities than their developing counterparts, or offer services based on varying tariff structures which often do not encourage their use. These are factors that must be taken into account when planning ship operations.

The provision of reception facilities and the extent to which ships use them are both factors influenced by cost; many ports which have installed reception facilities find their facilities ignored in favors of ports which provide them at more favorable rates.

However, there is a mechanism by which ships can report inadequate reception facilities to their flag administration and masters are encouraged to use it.

Consequences of not following the rules

Ship-generated pollution has always been high profile, whether caused by a major tanker accident or a black plastic garbage sack being thrown overboard. Companies and their employees should be aware that the public at large is very environmentally conscious and sensitive to pollution from ships. As a result the public has become the eyes and ears of the authorities and the media, providing additional resources for the enforcement of MARPOL.

An incident involving the casual dumping of waste can result in extremely heavy fines and do incalculable damage to a company's image. Public reaction and subsequent negative impact in the market-place can prove to be a very effective deterrent.

Ignorance of the regulations is no defense. If the ship or the crew are seen to pose a risk of marine pollution, the vessel can be detained under Port State Control until the deficiencies are corrected.

PARTICULAR OF VESSEL

General Data

Ship Name:	**M/S Sanco Spirit**
Built:	**2009**
Yard no:	**141**
Classification Society:	**DNV +1A1, ICE-C, EO, DYNPOS AUTR, RP, HELIDECK**
Class Id No:	**DNV ID: 28166**
IMO No:	**9429936**
Flag	**GIBRALTAR**
Class Notation	
Call sign	**ZDJN3**
Homeport	**GIBRALTAR**

Ship dimensions

Length, Loa	**86 m**
Beam, B	**16 m**
Draft moulded:	**6,50/7,70 m**
Air draft	**31m**
Gross/net:	**4000**
BT:	**4348 t**
Speed, V	**15,5 Knots**
GM, range of values	
Incinerator	**yes**
Compactors	**Yes**
Other disposal equipment	**Foodwaste Grinder**

GENERAL

MARPOL 73/78, ANNEX V, Regulation 9

Placards, garbage management plans and garbage record-keeping

(1) (a) every ship of 12 meters or more in length overall shall display placards which notify the crew and passengers of the disposal requirements of regulations 3 and 5 of this Annex, as applicable

(b)The placards shall be written in the official language of the State whose flag the ship is entitled to fly and, for ships engaged in voyages to ports or offshore terminals under the jurisdiction of other Parties to the Convention, in English or French.

(2) Every ship of 400 tons gross tonnage and above, and every ship which is certified to carry 15 persons or more, shall carry a garbage management plan which the crew shall follow. This plan shall provide written procedures for collecting, storing, processing and disposing of garbage, including the use of the equipment on board. It shall also designate the person in charge of carrying out the plan. Such a plan shall be in accordance with the guidelines developed by the Organization and written in the working language of the crew.

(3) Every ship of 400 tons gross tonnage and above and every ship which is certified to carry 15 persons or more engaged in voyages to ports or offshore terminals under the jurisdiction of other Parties to the Convention and every fixed and floating platform engaged in exploration and exploitation of the sea- bed, shall be provided with a Garbage Record Book. The Garbage Record Book, whether as a part of the ship's official logbook or otherwise, shall be in the form specified in the Appendix to this Annex;

(a) each discharge operation, or completed incineration, shall he recorded in the Garbage Record Book and signed for on the date of the incineration or discharge by the officer in charge. Each completed page of the Garbage Record Book snail be signed by the master of the ship. The entries in the Garbage Record Book shall be both in an official language of the State whose flag the ship is entitled to fly, and in English or French. The entries in an official national language of the State whose flag the ship is entitled to fly shall prevail in case of a dispute or discrepancy;

(b) the entry for each incineration or discharge shall include date and time, position of the ship, description of the garbage and the estimated amount incinerated or discharged;

(c) the Garbage Record Book shall be kept on board the ship and in such a place as to be available for inspection in a reasonable time. This document shall be preserved for a period of two years after the last entry is made on the record;

(d) in the event of discharge, escape or accidental loss referred to in regulation 6 of this Annex an entry shall be made in the Garbage Record Book of the circumstances at and the reasons for, the loss.

(4) The Administration may waive the requirements for Garbage Record Books for;

(a) any ship engaged on voyagers of 1 hour or less in duration which is certified to carry 15 persons or more; or

(b) fixed or floating platforms while engaged in exploration and exploitation of the sea-bed.

(5) The competent authority of the Government of a Party to the Convention may inspect the Garbage Record Book on board any ship to which this regulation applies while the ship is in its ports or offshore terminals and may make a copy of any entry in that book and may require the master of the ship to certify that the copy is a truer copy of such an entry. Any copy so made, which has been certified by the master of the ship as a truer copy of an entry in the ship's Garbage Record Book shall be admissible in any judicial proceedings as evidence of the facts stated in the entry. The inspection of a Garbage Record Book and the taking of a certified copy by the competent authority under this paragraph shall he performed as expeditiously as possible without causing the ship to be unduly delayed.

(6) in the case of ships built before 1 July 1997, this regulation shall apply as from 1 July 1998.

These Guidelines provide instructions on garbage management and disposal in order to meet the requirements of the International Convention for the Prevention of Pollution from Ships (MARPOL 73/78) Annex V.

Special areas

According to Regulation 1 of MARPOL Annex V; a special area means a sea area where for recognised technical reasons in relation to its oceanographical and ecological condition and to the particular character of its traffic the adoption of special mandatory methods for the prevention of sea pollution by garbage is required. Special areas include those listed in regulations of MARPOL Annex V, which is reproduced as follows;

Disposal of garbage within special areas

For the purposes of this Annex the special areas are the Mediterranean Sea area, the Baltic Sea area, the Black Sea area, the Red Sea area, the 'Gulfs area', the North Sea area, the Antarctic area and the Wider Caribbean Region, including the Gulf of Mexico and the Caribbean Sea which are defined as follows;

(a) The Mediterranean Sea area means the Mediterranean Sea proper including the gulfs and seas therein with the boundary between the Mediterranean and the Black Sea constituted by the 41* N parallel and bounded to the west by the Straits of Gibraltar at the meridian 5*36'W.

(b) The Baltic Sea area means the Baltic Sea proper with the Gulf of Bothnia and the Gulf of Finland and the entrance to the Baltic Sea bounded by the parallel of the Skaw in the Skagerrak at 57*44.8'N.

(c) The Black Sea area includes the Black Sea proper with the boundary between the Mediterranean and the Black Sea constituted by the parallel 41 *N.

(d) The Red Sea area means the Red Sea proper including the Gulfs of Suez and Aqaba bounded at the south by the rhumb line between Ras si Ane (12*28.5'N,43*19.6'F) and Husn Murad (12*40.4'N,43*30.2'E).

(e) The Gulfs area means the sea area located north-west of the thumb line between Ras al Hadd (22*30'N,59*48'F) and Ras al Fasteh (25*04'N,61 *25'E).

(f) The North Sea area means the North Sea proper including seas therein with the boundary between;

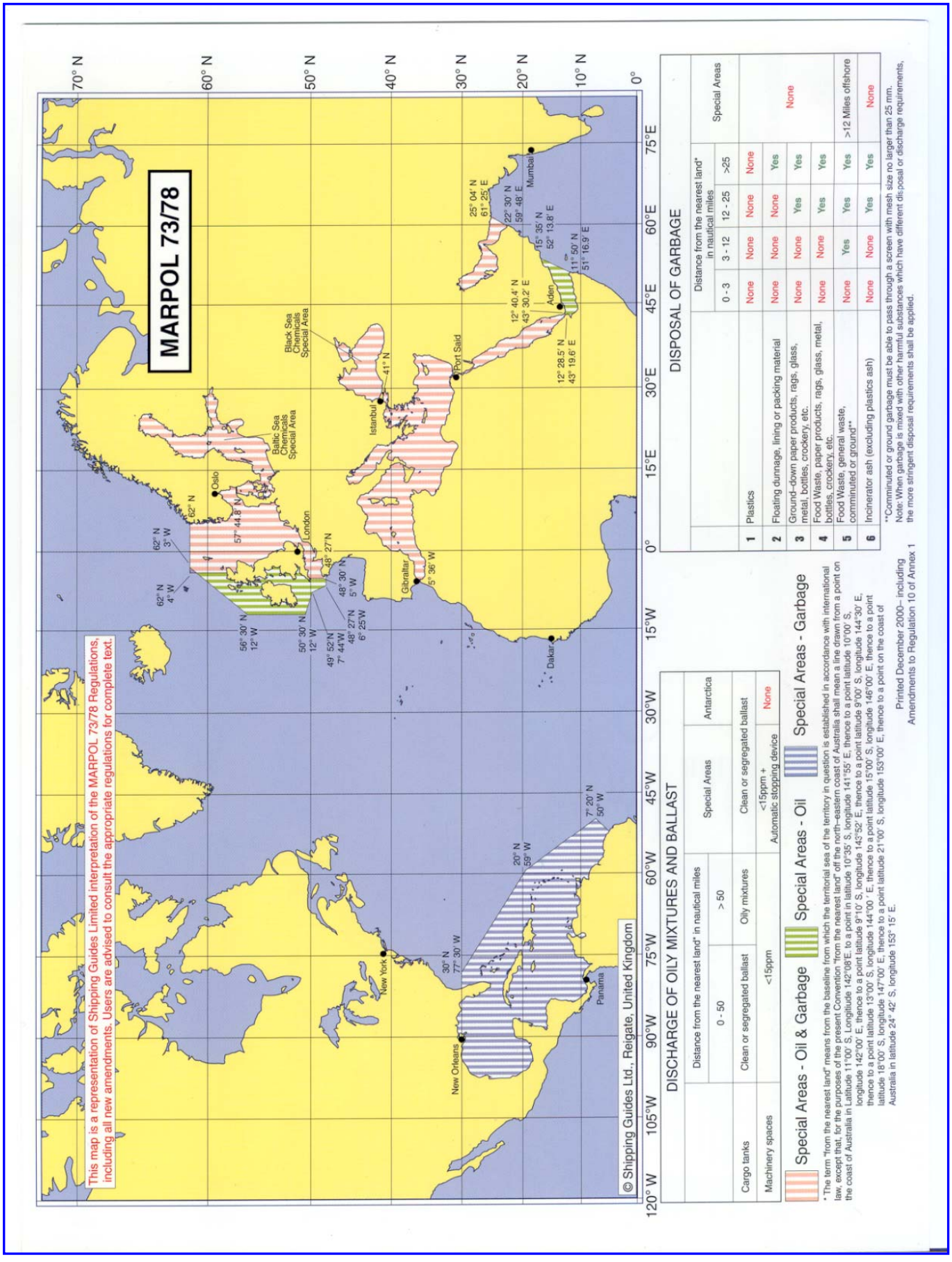
(i) the North Sea southwards of latitude 62*N and eastwards of longitude 4*W;

(ii) the Skagerrak, the southern limit of which is determined east of the Skaw by latitude 57*44.8'N;and

(iii) the English Channel and its approaches eastwards of longitude 5*W and northwards of latitude 48*30'N.

(q) The Antarctic area means the sea area south of latitude 60*S.

(F) The Wider Caribbean region, as defined in article 2, paragraph 1 of the Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region (Cartegena de Indias 1003), means the Gulf of Mexico ann the Caribbean Sea proper including the bays and seas therein and that portion of the Atlantic Ocean within the boundary constituted by the 30*N parallel from Florida eastward to 77*30W meridian, thence a rhumb line to the intersection of 20*N parallel and 59*W meridian, thence a rhumb line drawn to the intersection of 7*20'N parallel and 50*W meridian, thence a rhumb line drawn south-westerly to the eastern boundary of French Guiana.


MARPOL 73/78
This map is a representation of Shipping Guides Limited interpretation of the MARPOL 73/78 Regulations, including all new amendments. Users are advised to consult the appropriate regulations for complete text.
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Special Areas - Oil & Garbage
Special Areas - Oil
Special Areas - Garbage
Baltic Sea Chemicals Special Area
Black Sea Chemicals Special Area
Oslo
London
Istanbul
Port Said
Gibraltar
Dakar
Aden
Mumbai
New York
New Orleans
Panama
DISCHARGE OF OIL MIXTURES AND BALLAST
DISPOSAL OF GARBAGE
Printed December 2000– including Amendments to Regulation 10 of Annex 1

General

To achieve cost-effective and environmentally sound results, a combination of three complementary techniques to manage garbage;

- source reduction;
- recycling; and
- disposal.

When requisitioning stores and provisions, the Management should encourage the suppliers to apply the substitutionary principle in order to reduce, to the greatest possible extent and at an early stage, the generation of garbage on board ships.

A ship's garbage is made up of distinct components, some of which are addressed in MARPOL 73/78, whilst others may be addressed locally, nationally or regionally, e.g. domestic, operational, cargo-associated, food and maintenance wastes. Each component should be evaluated separately to determine the best waste management practice for that waste.

Source reduction and recycling are dealt with in this chapter, while disposal techniques are addressed under 'Procedures for disposing of garbage'.

Source reduction

Source reduction is a waste management technique which reduces the amount and/or toxicity of the waste generated. The taking on board of potential garbage and the onboard generation of garbage should minimized.

Domestic wastes may be minimized through proper provisioning practices. The Management should encourage ships' suppliers to consider their products in terms of the garbage they generate. Options available to decrease the amount of domestic waste generated on board the ship include the following;

- bulk packaging of consumable items may result in less waste being created; however, factors such as the shelf-life of the contents once a containers is opened must be borne in mind to avoid increasing wastes;

- reusable packaging and containers can decrease the amount of garbage being generated; use of disposable cups, utensils, dishes, towels and cleaning cloths and other convenience items should be limited and replaced by washable items when possible;

- where practical options exist, provisions packaged in or made of material other than disposable plastic should be selected to replenish ship supplies unless a reusable plastic alternative is available.

Operational waste generation is specific to individual ship activities and cargoes. It is recommended that all those involved in the operation of the ship should co-operate and consider the garbage associated with various categories of cargoes and take action as needed to minimize its generation. Suggested actions are listed below;

- consider replacing disposable plastic sheeting used for cargo protection with permanent, reusable material;

- consider stowage systems and methods that reuse coverings, dunnage, shoring, lining and packing materials;

- dunnage, lining and packaging materials generated in port during cargo discharge should preferably be disposed of to the port reception facilities and not retained on board for discharge at sea;

- cargo residues are created through inefficiencies in loading, unloading and on-board handling. It may, in certain cases, be difficult for port reception facilities to handle such residues. Cargo should therefore be unloaded as efficiently as possible in order to avoid or minimize cargo residues.

The extent to which the company uses source reduction will depend on a ship's operations and ports of call and the relationship between companies and their suppliers. Ships that routinely call at the same port, use the same suppliers and purchase in volume may present a stronger case for source reduction than a ship engaged in world-wide trading that is probably supplied from various sources.

By initiating the right source reduction program, the company can substantially reduce the vessel's garbage disposal costs. Disposal costs may be further reduced by the sale of recyclables that have been substituted for non-recyclables in the source reduction program.

Assessing the outcome of a source reduction program should take into account an estimate of the waste generated before implementation; the amount of waste generated after implementation; and any new external factors affecting waste generation, such as an increase or decrease in the size of the crew . The source reduction strategy be re-evaluated periodically to determine which practices produce the best results. The strategy can then be adjusted, if necessary.

Recycling

The procedures for collecting, processing and storage on which the garbage management plan is based require the description of handling of garbage, taking into account possible local recycling arrangements.

In general, the largest volume of ship-generated waste, common to all ships, is garbage.
The waste management technique which has the potential for the greatest measurable reduction in a ship's garbage waste stream is recycling of garbage.

Recycling diverts materials from disposal and therefore reduces disposal costs. However, it does not necessarily generate revenues. A fee for accepting the recyclable material ashore is often required. On other occasions, revenue may be received from the sale of recyclable materials. Therefore, the recycling revenue realized by the ship may be calculated as the net savings obtained from diverting the recyclables from waste disposal fees, plus any revenues generated from the sale of the recyclables if any, minus any fee charged for depositing the recyclables at the redemption centre.

Recycling markets for ship-generated garbage are generally available in most major shipping ports. The sale of recycled materials will depend very much on the level to which local markets ashore have developed, and information regarding the location of recycling pants and their availability is information that should be collated and transmitted to the ship with other relevant port information. Small, local recycling facilities should also be investigated to supplement the opportunities and services provided by larger, more established facilities, but some analysis should be carried out to check whether the additional resources can he justified for segregating garbage if the ship's recycling program is to be dependent on such small recycling facilities, or indeed if there are no such facilities.

Collection for recycling

Due to poor developed local marked in the vessels trading area, the vessel does not collect garbage for recycling. However, situation will be evaluated on a yearly basis.

MANAGEMENT POLICY

The company's safety and environmental protection policy is described in the Office Manual. The Garbage Management Plan is intended to meet the objectives of the company's policy and conform to the requirements of the regulations.

The following environmental principles are incorporated in the management systems;

1 Environmental management is recognized as being among the highest priorities and practices for conducting operations in an environmentally sound manner;

2 continue to improve practices and environmental performance, taking account of current legislation, industry codes of practice, technical codes of practice, technical developments, consumer needs and community expectations;

3 take voluntary steps where it is considered possible and appropriate to improve current environmental standards;

4 educate, train and motivate employees to conduct their activities in an environmentally responsible manner;

5 assess, design and operate ships taking into consideration the efficient use of energy and materials, the minimization of any adverse environmental impact and waste generation, and the safe and responsible disposal of residual wastes;

6 develop and maintain emergency preparedness plans in conjunction with emergency services, relevant authorities and the community, consistent with current legislation and good practice;

7 promote the adoption of these principles by suppliers and contractors acting on behalf of the company, encouraging and, where appropriate, requiring improvements in their practices to make them consistent with those of the company;

8 promote good public relations and foster openness and dialogue with employees, relevant authorities and the public, anticipating and responding to their concerns about the potential environmental hazards and impact of company operations; and

10 measure environmental performances, conduct regular audits and assessments of compliance with company requirements, legal requirements and these principles and publish relevant information internally and externally as appropriate.

In keeping with best management practice, changes in company policy should be supported by senior management. The management policy statement should acknowledge the company's attitude towards conservation of the marine environment and its wish to comply with applicable regulations, and should state the extent to which the company will commit resources. Reference should be made to the designated person and to those to whom the policy applies.

Language

As required by the regulations, this Garbage Management Plan is written in English, as the working language of the ship's personnel.

Training

Ships' personnel are required to know about the procedures for minimising the amount of potential garbage, and about shipboard handling and storage procedures. They are also expected to be aware of those areas designated as special areas, and familiar with the disposal and discharge requirements under MARPOL Annex V, inside and outside a special area.

Under regulation 8 of MARPOL Annex V, a ship may be subjected to a Port State Control inspection where there are 'clear grounds' for believing that the master and crew are not familiar with essential shipboard procedures relating to the prevention of pollution by garbage. If the deficiency of the crew is believed to provide a serious risk of pollution to the marine environment, the vessel may have a deficiency registered against it, or more importantly be detained until such time as the situation has been corrected. It is therefore in the best interests of the ship and its operation that the crew are educated about MARPOL Annex V and their responsibilities under its regulations.

Procedure

On joining the vessel, personnel should be familiarised with

- the position of garbage collection points,
- storing, processing and disposal procedures as stated in this plan.

Personnel should be trained to recognise different waste categories and actively encouraged to comply with the Garbage Management Plan. (Form D-14 to be used.)

Personnel are required to participate in the garbage management system as specified in this plan. Instruction and familiarisation with onboard facilities, including the routine for garbage management, should be provided for personnel joining the ship.

Personnel are to be made aware of the location of special areas designated under MARPOL, Annex V and instructed on the disposal and discharge requirements to be adhered to while in those areas.

Designated person in charge of carrying out the plan

On board, the **Chief Officer** is responsible for implementing the procedures within the Garbage Management Plan, and will be responsible for maintaining the Garbage Record Book.

The duties of the Chief Officer in this matter will include;

- ensuring placards are displayed in accordance with the regulations;
- ensuring that personnel comply with the ship's waste management strategy;
- ensuring incineration or other treatment of wastes in accordance with the instructions;
- liaison with the bridge team regarding the ship's position for permissible overboard discharge of certain garbage;
- liaison with shore authorities for port reception facilities;
- liaison with the Chief Engineer as heads of department on a daily basis regarding any problems encountered with garbage management;
- reviewing garbage management practices on board the ship and recommending amendments to the plan as necessary; and
- ensuring that the Garbage Record Book is completed and signed as required by the regulations.

Procedures for collecting garbage

Collection and separation are to be carried out according to the procedures laid down in this Garbage Management Plan. The procedures for collection identify suitable receptacles for collection and separation, the location, type and size of those receptacles, the process of transportation and handling from the source to the collection and separation stations.

To reduce or avoid the need for sorting after collection, five categories of distinctively marked garbage receptacles is provided to receive garbage as it is generated. At each collection point receptacles are provided as required and clearly marked and distinguishable by colour as follows:

* Plastics and plastics mixed with non-plastic garbage (red)
* Food wastes (which include materials contaminated by such wastes); (white)
* Harmful/hazardous waste (which include materials contaminated by such wastes); (black)
* Other garbage which can be disposed of at sea. (grey)
* Floating dunnage, lining and packing material.

This will aid separation, processing, recycling and disposal operations.

Receptacles are to be made of suitable material.
Receptacles for Harmful waste to be made of steel fitted with suitably tight cover and be leak-proof. Receptacles for food waste to be fitted with suitably tight covers.

Garbage collection points are established in the following areas

* Galley: 1 container for Food waste.
  1 container for other.

* Engine room: 1 container for harmful/hazardous substances.
  1 container for other garbage.

* Deck: 1 container for other garbage beside exit door paint store.
  1 container for Harmful waste beside exit door paint store.
  1 container for plastics and plastic.
  1 pallet for dunnage etc.

* Accommodation: located in dayroom, Cabins and on bridge.
  All containers for other garbage.

The collected garbage is to be taken from collection point by hand (or trolley where possible) via the shortest route to the central reception area located in cargo hold, incinerator room.

This should be done at all times in accordance with any health and safety regulations of the flag administration. Dunnage to be taken from collection point by hand (or trolley where possible) via the shortest route to the reception area located in front of superstructure.

Containers for all categories of waste are not provided for all collection points. If container for category waste is not available at place of production, it is important that waste at hand is transported to nearest container for that category waste.

Each department has nominated a person who is responsible checking the receptacles and transporting the garbage to the central reception area at poop deck, port side for appropriate disposal.

For the deck department this person is AB no. 1,
For the engine department this person is Chief Engineer
For the accommodation/housekeeping this person is Cook.

Receptacles in each area are to be checked/emptied and cleaned every Saturday and/or more often whenever required.
Galley receptacle is to be emptied and cleaned daily and/or more often whenever required.

The Chief Officer is to ensure that personnel are familiar with the location and nature of the receptacles around the vessel. The officers and crew are to be trained to recognise the importance of using the appropriate receptacle when initially disposing of garbage to avoid creating work which would be required by further sorting at a later stage.

Incinerator room.

Cargo hold centre port side.

Harmful/Hazardous Substances

Substances that may pose harm to the marine environment and may not be suitable for disposal at reception facilities equipped to handle general garbage because of their possible safety hazards. This category includes flammable material and/or rags which have been saturated with oil as controlled in Annex I to the Convention, or which have been saturated with a substance defined as a harmful substance in the other annexes to the MARPOL 73/78 Convention.
Harmful waste must be retained on board ship for discharge at port reception facilities. When Harmful/Hazardous waste is not separated from other garbage, the mixture must be treated as if it were all Hazardous waste.

Food wastes

Some governments have regulations for controlling human, plant and animal diseases that may be carried by foreign food wastes and materials that have been associated with them (e.g. food packaging and disposable eating utensils). Such regulations may require incinerating, sterilising, or other special treatment of garbage to destroy possible pest and disease organisms. In these circumstances such garbage should be kept separate from other garbage and preferably retained for disposal in port in accordance with the laws of the receiving country With regard to such garbage, governments have an obligation to ensure the provision of adequate reception facilities. Precautions must be taken to ensure that plastics contaminated by food wastes (e.g. plastic food wrappers) are not discharged at sea with other food wastes.

Plastics and plastics mixed with non-plastic garbage

Plastic garbage must be retained on board ship for discharge at port reception facilities unless reduced to ash by incineration. When plastic garbage is not separated from other garbage, the mixture must be treated as if it were all plastic.

Dunnage

Floating dunnage, lining and packing materials.
Dunnage lining and packing material which will float is separated from other garbage, since this material is subject to a different discharge limit from other garbage in the same category.

Other garbage

Garbage in this category includes, hurls not limited to, paper products, rags, glass, metal, bottles, crockery.

Procedures for processing garbage

Garbage will be processed under the responsibility of the Chief Officer who is to ensure that the waste is segregated into the following categories:

- plastic
- floating dunnage, lining or packing materials,
- ungrounded paper products, rags, metal, bottles, crockery etc.
- food waste
- harmful/hazardous waste e.g. used chemical solution, flammable materials

The vessel does not have any processing equipment. Processing is the waste management practice employed to prepare recycles and ship-generated wastes for storage or disposal.

Waste which can be legally discharged into the sea is included in the summary of at sea garbage disposal, which is to be adhered to.

Waste which can not be legally discharged into the sea shall be discharged to port reception facilities.

Location

The vessel's Central Garbage Storage Stations is located in the forward of helideck. Storage station for floating dunnage, lining or packing materials is located forward of helideck. The stations have been clearly marked.

Capacity

1. For the intermediate storage of small amounts of garbage near the places of waste generation, containers are provided which are:

   - Of sufficient number;
   - Approximately 15 liters in accommodation areas and 60 liters in operational areas;
   - Easy to handle manually;
   - Fitted with a tight-closing lid in operational areas;
   - Easy to clean; and
   - In conformity with safety requirements.

2. The Central garbage storage system on board can be described as follows;

   - Storage capacity volume;
     1. Plastic : 200 l
     2. Food waste : 200 l
     3. Harmful/Hazardous waste : 200 l
     4. Other garbage : 200 l

   - All fitted with a tight-closing lid;
   - Easy to clean; and
   - In conformity with safety requirements.
   - Harmful/hazardous storage container to be made of steel and be leak - proof.

* Floating dunnage, lining or packing materials are stowed and secured on pallets. Station in the cargo hold.

Intended use

Garbage collected from living and working areas throughout the ship should be delivered to designated storage locations at poop-deck. Garbage that must be retained for disposal in port may require long-term storage.

The vessel is using separate containers for short-term (disposable garbage) and trip-long (non-disposable garbage) storage.

Procedures

The Chief Officer in compliance with the garbage management policy requires the segregation of garbage with a view to the following;

- Recycling;
- Immediate disposal, in accordance with MARPOL,
- Retention, until the ship has cleared a restricted area;
- Special attention, i.e. chemicals, flammable waste etc.;
- Long term storage.

The Chief Officer should ensure that all waste is stored in a safe and hygienic manner. Food waste and associated garbage which may decompose during storage should be sealed in airtight containers provided for this purpose. Such containers are disposable and the waste should be sent to the reception facility in these containers.

If the Chief Officer has grounds to believe garbage is not being separated into the specific containers at source and is thus causing problems during storage, the matter should be raised with the departmental officers for remedial action as appropriate.

If long term storage, including airtight garbage containers, creates any health problems or pests are noticed, the Chief Officer should raise the matter with a company representative.

Disinfection and pest control, both preventive and remedial, should be carried out regularly in garbage storage areas.

Procedures for disposing of garbage

Although disposal at sea is possible under Annex V, discharge of garbage to port reception facilities should always be the preferred method. Disposal of ship-generated garbage must be done in a manner consistent with the regulations summarized in Table 1. Possible options for handling and disposal to meet the regulations are set out in Table 2.

When disposing of garbage, the following points should be considered.

Garbage which may be disposed of at sea can simply be discharged overboard. Disposal of un compacted garbage is convenient, but may result in an increased number of floating objects which could reach shore even when discharged beyond 25 nautical miles from the nearest land. Compacted garbage is more likely to sink and is thus less likely to pose aesthetic problems. If necessary and possible, weights should be added to promote sinking. Compacted bales of garbage should be discharged in deep water (50 m or more) to prevent rapid loss of their structural integrity due to wave action and currents.

Floating cargo-associated waste that is not plastic or otherwise regulated under other MARPOL annexes may be discharged beyond 25 nautical miles from the nearest land. Cargo-associated waste that will sink and is not plastic or otherwise regulated may be discharged beyond 12 nautical miles from the nearest land. Most cargo-associated waste may be generated during the loading and unloading process, usually in port. It is recommended that every effort be made to deliver these wastes to the nearest port reception facilities prior to the ship's departure.

Maintenance wastes may be contaminated with substances, such as oil or toxic chemicals, controlled under other MARPOL annexes. In such cases, the more stringent disposal requirements take precedence and the waste must be threatened as Harmful/Hazardous waste.

Local quarantine regulations may prohibit the landing of certain food wastes and enquiries as to whether these exist should be made at the commencement of the voyage so that disposal requirements are understood and planned for. Disposal of ship generated garbage should be in a manner consistent with the regulations and in accordance with the company's policy.

If garbage is to be discharged in port, the ship's agents should be informed that disposal should be through a reputable company. The agent should liaise with the port authority regarding the disposal, including any special conditions imposed at the time of collection.

Table 1 Summary of at-sea garbage disposal

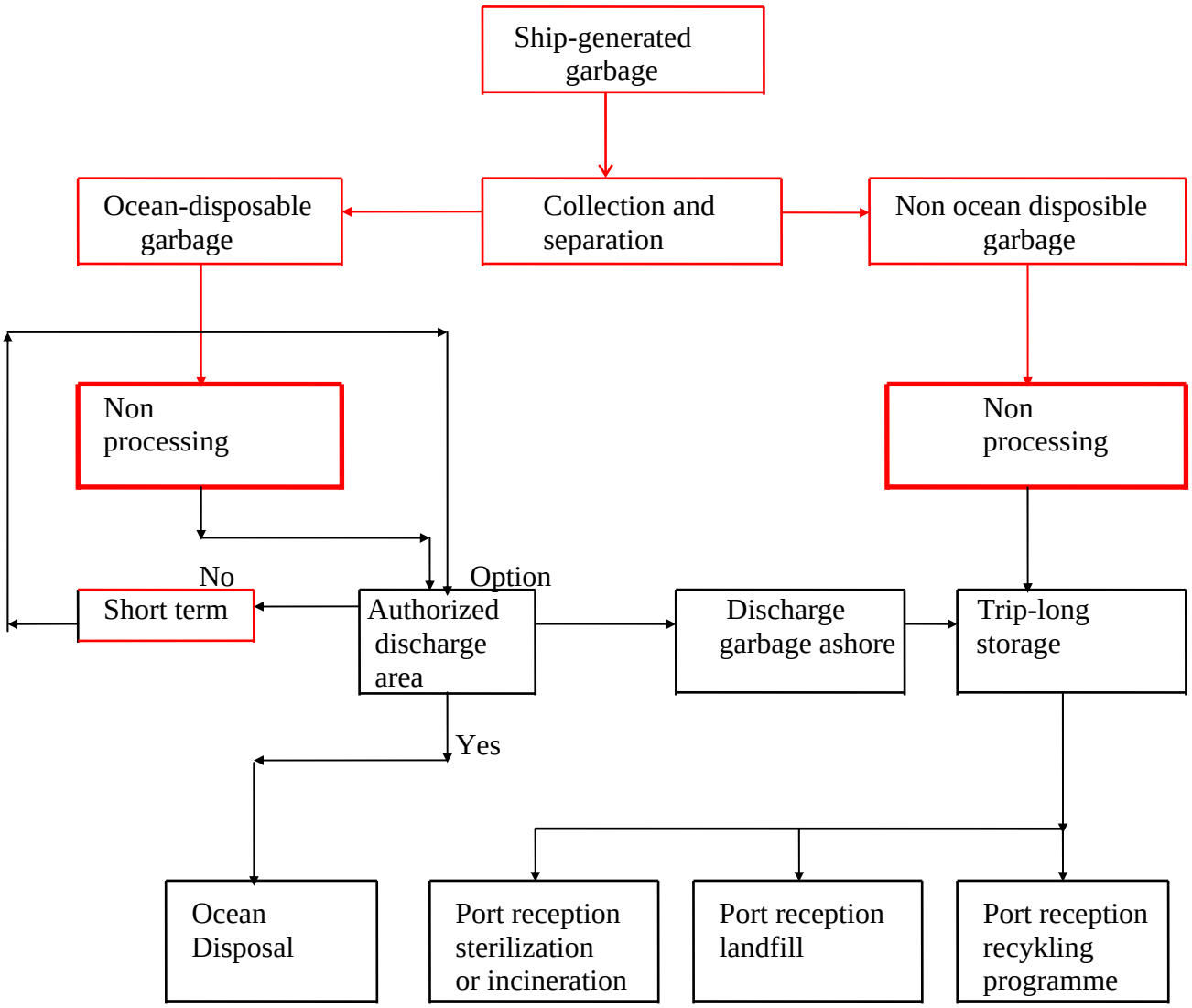
	Outside special areas	**In special areas**
Plastics - includes synthetic ropes and fishing nets and plastic garbage bags	Disposal prohibited	Disposal prohibited
Floating dunnage, lining and packing materials	>25 miles offshore	Disposal prohibited
Paper, rags, glass, metal, bottles, crockery and similar refuse	>12 miles offshore	Disposal prohibited
All other garbage including paper; rags, glass, etc. comminuted or ground	>3 miles offshore	Disposal prohibited
Food waste not comminuted or ground	>12 miles offshore	>12 miles offshore
*Food waste comminuted or ground	>3 miles offshore	>12 miles offshore
Mixed refuse types	t	t

* Comminuted or ground garbage must be able to pass through a screen with mesh size no larger than 25 mm.

t When garbage is mixed with other harmful substances having different disposal or discharge requirements, the more stringent disposal requirements apply.

Notes:
Although discharge at sea, except in special areas, of a wide range of ship-generated garbage is permitted outside specified distances from the nearest land, preference should be given to disposal at shore reception facilities.

Table 2 - OPTION FOR SHIPBOARD HANDLING AND DISPOSAL OF GARBAGE



Disposal into reception facilities

The main aim of MARPOL 73/78 is to minimize the damage to the marine environment by pollution from ships, including garbage. In order to achieve this goal, ship operators are encouraged to adopt policies whereby even garbage that is permitted to be discharged to the sea under Annex V of MARPOL 73/78 is stored on board and then disposed of at a suitable port reception facility.

Experience has shown that disposal to reception facilities of plastics, such as floating plastic (polyethylene) foil used in the packaging of cargo, is more difficult and expensive than disposal of paper-type packaging materials. However, the disposal of plastics into the sea is strictly prohibited and all garbage mixed with plastic must be delivered to a reception facility. 'Clinkers'. or any hard residues from the incineration of plastics aboard a ship, are treated as Annex V wastes. They must be handled as plastic waste and discharged to a port reception facility.

The delivery of garbage is to be documented in the vessel's Garbage Record Book and receipts kept on board for two years.

Disposal into the sea

The disposal of ship-generated plastic wastes into the sea is prohibited. Other garbage may be disposed of into the sea under certain restrictive operational conditions as permitted by Annex V of MARPOL 73/78.
(See Table-1)

Garbage Record Book and record keeping

The Garbage Record Book which forms part of the regulations is an important document and should be considered as an official ship's record. The entries in the Garbage Record Book are to be in English, as the official language of the flag state.

The record of garbage discharge is to be completed after each;

- discharge operation to sea, to reception facilities ashore or to other ships;
- incineration.

Entries for incineration and discharges should include;

- date and time of start and stop of operation;
- position of the vessel;
- estimated quantity of garbage;
- name of ship or barge to which garbage was transferred;
- name of port or reception facility when discharged ashore.

In addition to routine entries, an entry is to be made in the Garbage Record Book with regard to the circumstances of and reasons for unintentional discharge, escape or accidental loss due to;

a) the disposal of garbage from the ship, necessary for the purpose of securing the safety of the ship and those on board, or saving life at sea, or

b) the release of garbage resulting from damage to the ship or its equipment, provided that all reasonable precautions have been taken before and after the occurrence of the damage, for the purpose of preventing or minimizing any subsequent pollution.

The regulations require each officer responsible for incineration or discharge operation to sign the record book, and the master is charged with signing each completed page. The (designated person] should ensure that these requirements are complied with. The Garbage Record Book should be kept on board the ship and be available for inspection. A sample Garbage record book is included in Annex 1 of this manual. The book should be retained on board for a period of two years after the last entry is made.

Appendix 3. SOPEP

SHIPBOARD

OIL POLLUTION

EMERGENCY PLAN

FOR

M/V "SANCO SPIRIT"

ZDIT8 - IMO NO. 9429936

Report Number 141102105

MULTI MARITIME AS
P.O.Box 90, N-6801 FØRDE
Phone 47 57823000
Telefax 47 57828451
E-mail: firmapost@multi-maritime.no

1 Introduction

2 Reporting requirements

3 Steps to control discharge

4 National and local co-ordination

5 Appendix

I confirm that I have read and understood the contents in all sections of this Shipboard Oil Pollution Emergency Plan.

Date The Master's own signature

Dato The Master's own signature

Date The Master's own signature

Date The Master's own signature

Date The Master's own signature

Date The Master's own signature

Date The Master's own signature

OIL POLLUTION EMERGENCY PLAN	SECTION	0
LIST OF CHANGES	PAGE	3
	REV. NO.	0
	DATE	

PAGE	REVISION				SIGNATURE
	NO.	YEAR	MONTH	DAY	

OIL POLLUTION EMERGENCY PLAN	SECTION	0
SHIP IDENTIFICATION	PAGE	4
	REV. NO.	0
	DATE	

Name of Vessel	:	m/s Sanco Spirit
Type of Ship	:	Seismic vessel
Port of Registry	:	Gibraltar
Flag	:	Gibraltar
Signal Letters	:	xxxx
IMONumber	:	IMO 9429936
Gross Tonnage	:	4450MT
Classification Society	:	DnV
Previous names	:	-
Builder (yard)	:	Vaagland Baatbyggeri A/S, YARD NO. 141
Date of delivery	:	October 2009
Length overall	:	86,5 M
Breadth overall	:	16,00 M
Summer draught	:	5.80 M
Height from keel to top of mast	:	abt 29,8 M
Transverse thrusters fitted	:	Bow: [1] Stern: [0] None: [ ]
Propeller pitch is	:	Fixed: [ ] Controllable: [X]

Details of any major modification or rebuilding: …….....…
……
Other relevant information specific to the ship:……..
……
……

OWNERS INFORMATION

Owner:	Name	:	Sanco Holding A/S
	Address	:	6083 Gjersvika, Norway.
	Phone	:	+47 70 02 63 90
	Fax	:	+ 47 70 02 63 99
	24 Hour contact	:	
	Mobile tel.:	:	+47 95 70 60 32
Operator:	Name (if different from above)	:	Jon Aklestad
	Address	:	xxxx
	Telephone	:	+47 90 14 93 44
	Fax	:	+47 70 02 63 99
	24 Hour contact	:	

Confirmation …… 2

List of Changes …… 3

Ship Identification …… 4

Contents . …….. 5

Summary Flowchart ……..…… 7

1 Introduction ..……. 8

Preamble …… 9

2.1 General ……. 10

2.2 Reporting Procedures…… 10

2.2.1. When to Report ……..…… 10
2.2.1.1 Actual Discharge.....…… 10
2.2.1.2 Probable Discharge ..... …… 11

2.2.2. Information Required …… 11
Example of Initial Report …… .…… 15
Initial Notification Form ….. …… 16
Reporting required …… 17

2.2.3 Who to Contact ….. …….. 18
2.2.3.1. Coastal State Contracts ……..…… 18
2.2.3.2. Port Contracts .. ……. 19
2.2.3.3. Ship Interest Contracts …….……..…. 19

3 Steps to Control Discharge …….. 20

3.1. Operation Spills …….……. 20
3.1.1 Operation Spill Prevention…. …… 20
3.1.2 Pipeline Leakage …….…… 21
3.1.3 Tank Overflow.....……. 21
3.1.4 Hull Leakage ……... 22
3.1.5 Spill caused by Equipment in Machinery Spaces…… 22

3.2. Spills Resulting from Causalities …….. 23

3.2.1 Grounding. …..…… 23

3.2.1.1 Prevention of Fire and Explosion.…….. 24

3.2.1.2 Extension of Hull Damage…….…… 24

3.2.1.3 Prosedure to Reduce or Stop Outflow of Oil ……. …….. 24

3.2.1.4 Refloating by own Means …….. …….. 25

3.2.1.5 Securing of the Ship……..……. 26

3.2.2 Fire / Explosion ……. 26

3.2.3 Collision ……. 27

3.2.4 Hull Failure..... …… 28

3.2.5 Excessive List. ……... 29

3.2.6 Transfer of Bunker / Lightening ……... 30

3.3 Damage, Stability and Hull Stress Calculation … ..…… 32

3.4 General Responsibility……. 33

3.4.1 Operation Oil Spill Response Check List……. 34

3.4.2 Causality Oil Spill Response Check List …… …….……... 35

3.4.3 Oil Spill Equipment …… 36

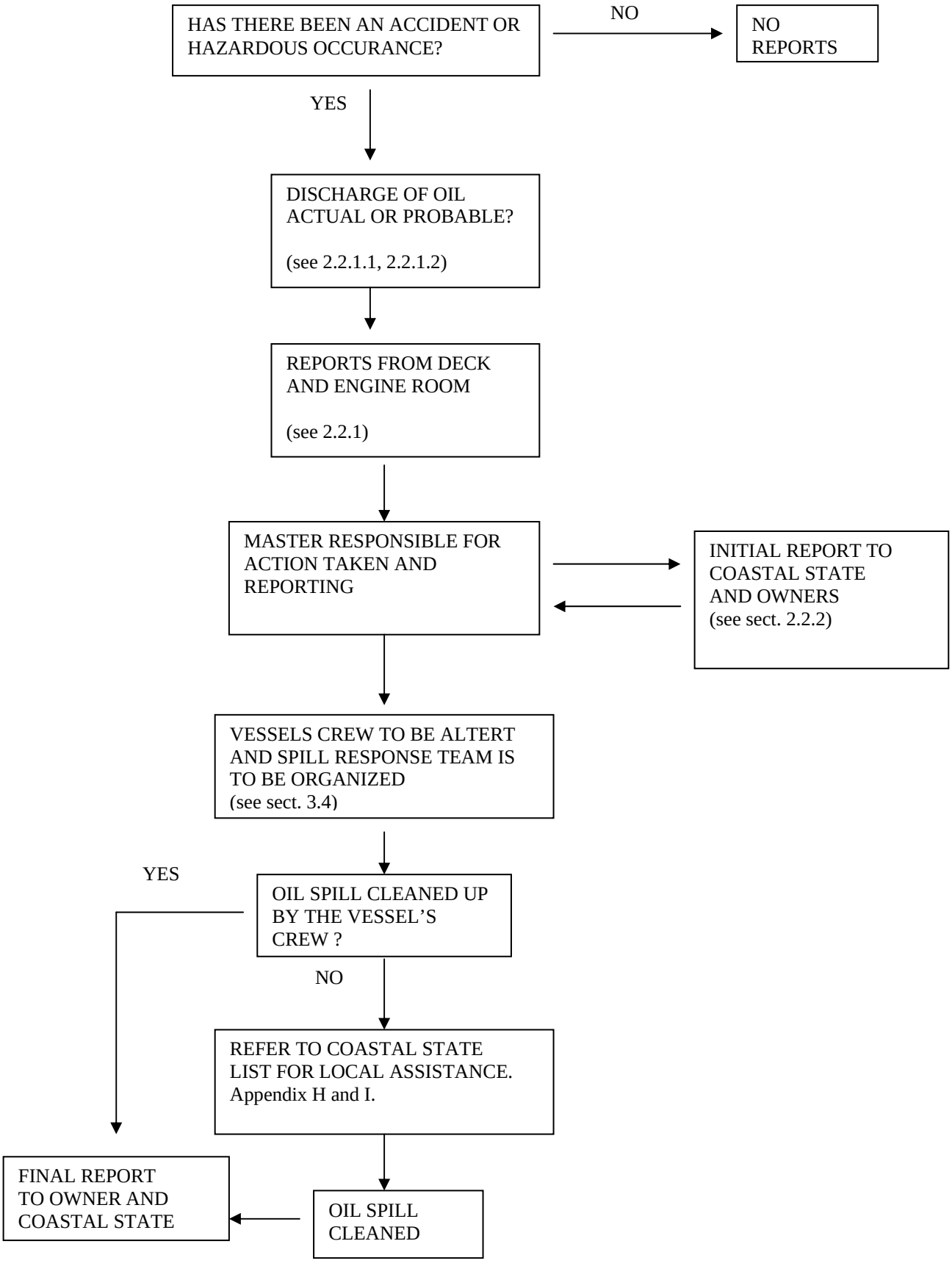
3.4.4 Record of Oil Prevention Drills ……..…..…… 37

4 National and Local Co-ordination …… 38

4.1 Additional Information ……..…….. 39

5 Appendixes …….……. 40

OIL POLLUTION EMERGENCY PLAN	SECTION	0
SUMMARY FLOWCHART	PAGE	7
	REV. NO.	0
	DATE	



1. The Shipboard Oil Pollution Emergency Plan (hereafter referred to as the ”Plan”) is written in accordance with the requirements of regulation 37 in compliance with latest revisopn of MARPOL Annex I of the International Convention for the Prevention of Pollution from Ships, 1973.

2. The purpose of the Plan is a guidance to our Masters and of officers on board the ship with respect to the steps to be taken when an oil pollution incident has occurred, or is likely to occur.

3. Used correctly in a given situation, you and we as ship operator will, avoid any claims and responsibility from official authorities.

4. The Plan contains all information and operational instructions as required by the ”Guidelines for the development of the Shipboard Oil Pollution Emergency Plan” as developed by the Organisation (IMO) and published under MEPC/Circ. 256.
The appendix contains names, telephone, telex numbers, etc. of all contacts referenced in the Plan, as well as other reference material.

5. The Plan will be regularly reviewed and updated. Revision will be the responsibility of the owner and carried out at intervals not exceeding 12 months.

1.1 This Plan is available to assist the ship's personnel in dealing with an unexpected discharge of oil. Its primary purpose is to set in motion the necessary actions to stop or minimise the discharge of oil, and to mitigate its effects.

1.2 Effective planning ensures that the necessary actions are taken in a structured, logical and timely manner.

1.3 The primary objectives of this Plan are to

- prevent oil pollution,
- stop or minimise oil outflows when damage to the ship or its equipment occurs,
- stop or minimise oil outflows when an operational spill occurs in excess of the quantity or instantaneous rate permitted under the present Convention.

1.4 Further, the purpose of the Plan is to provide our Master, officers and crewmembers with a practical guide to the presentation of oil spills and in carrying out the responsibilities associated with regulation 26 of Annex I to MARPOL 73/78.

- reporting procedures to report an oil pollution incident,
- Coastal State contacts to be contacted in the event of an oil pollution incident,
- response actions or reduce or control the discharge of oil following an incident,
- co-ordination with national and local Authorities in combating oil pollution.

1.5 In summary, the Plan will serve to promote a practised response when the ship's personnel are faced with an oil spill.

1.6 The Plan is designed as a ship-specific tool and together with the shorebased plans this Plan will be an effective instrument in mitigating the effects of an oil spill incident.

2.1 GENERAL

The reporting requirements of this section complies with those of regulation 26 of MARPOL 73/78, Annex I.

2.11 When the ship is involved in an incident which results in the discharge of oil, the Master is obliged under the terms of MARPOL 73/78 to report details of the incident, without delay, to the nearest Coastal State by means of the fastest telecommunication chanels available.

2.12 The intent of these requirements is to ensure that Coastal States are informed, without delay, of any incident giving rise to oil pollution, or threat of oil pollution, of the marine environment, as well as of assistance and salvage measures, so that appropriate action may be taken.

2.2 REPORTING PROCEDURES

For ease reference the reporting requirements in the context of this plan are divided in the following information blocks:

2.2.1 WHEN TO REPORT

Taking sumary flowchart (page 7) as a basic guide into consideration reports are necessary in the following cases:

2.2.1.1 ACTUAL DISCHARGE

The Master is obliged to report to the nearest Coastal State whenever there is a discharge of oil resulting:

- from damage to the ship,
- from damage to the ship’s equipment,
- for the purpose of securing the safety of the ship or saving life at sea,
- during the operation of the ship in excess of the quantity or instantaneous rate permitted under the present Convention.

2.2.1.2 PROBABLE DISCHARGE

The Master is obliged to report to owner and coastal state authorities even when no actual discharge of oil has occurred but there is a probability that one should.

The Master shall, in any case, report to owners for information about the situation involving probable discharge of oil.

However, as it is not practicable for the owner to lay down precise definitions of all types of situations involving probable discharge of oil; the Master obliges to judge by himself whether there is such a probability and whether a report should be made.

But it is recommended that the following is reported:

- damage, failure or breakdown which affects the safety of the ship (e.g. collision, grounding, fire, explosion, structural failure, flooding, cargo shifting etc.)

- failure or breakdown of machinery or equipment which results in impairment of the safety of navigation (e.g. failure or breakdown of steering gear, propulsion, electrical generating system, essential shipborne navigation aids etc.). These events should be carefully considered by the Master – taking into account the nature of the damage failure or breakdown of the ship, machinery or equipment as well as the ship's location, proximity to land, weather, state of the sea, and traffic density – as cases in which a probable discharge of oil is most likely.

In all cases the Authorities should be kept informed by the Master as to how the situation progresses and be notified when all threat of pollution has passed.

2.2.2 INFORMATION REQUIRED

As required in article 8 and Protocol I of the MARPOL 73/78

Convention the Master should report the particulars of an oil pollution incident. In this context the International Maritime Organization (IMO), in 1989, adopted Resolution A. 648 (16) “General Principles for Ship Reporting Systems and Ship Reporting Requirements, including Guidelines for Reporting Incidents Involving Dangerous Good, Harmful Substances and/or Marine Pollutants".

Nothing in this chapter relieves the Master in using sound judgement to make sure that any incident or probable discharge of oil i reported as quickly as possible in the prevailing situation.

When transmitting initial reports to the authorities of the nearest Coastal State the Master should take note of Resolution A. 648 (16). (Reporting format).

Especially, the format of the initial report as well as supplementary of follow-up reports should conform to the guidance contained in Res. A. 648 (16). All reporting whether initial or follow-up, should follow IMO’s reporting format as outlined below and should contain the following information:

An example for initial notification is shown on pages 15-16.
Following explanation is given:

Label	Function	Explanation
AA	Ship	Name, call sign, and nationallity;
BB	Date and time (UTC) of event	A 6-digit group giving day of month (first two digits), hours & minutes (last four digits);
CC	Position	A 4-digit group diving latitudes in degrees and minutes suffixed with N or S, and a 5-digit group giving longitude in degrees and minutes sufficient with E or W;

Label	Function	Explanation
DD	Position	True bearing (first 3 digits) and distance (state distance) in nautical miles from clearly identified landmark (state landmark);
DG	Dangerouse goods report	
EE	True course	A 3-digit group;
FF	Speed at time of incident	In knots and tenths of knots as a 3-digit group;
HS	Hartmful substances reports	
LL	Route information	Details of intended track;
MM	Radio communication	Full details of radio stations (names) and frequencies being guarded;
MP	Marine pollutants report	
NN	Time (UTC) of next report	A 6-digit group as under BB above;
PP	Cargo on board can be included in "RR" as relevant	Type(s) and quantity(ies) of cargo/bunker on board and brief details of any dangerous cargoes as well as harmful substances and gases that could endanger persons or the environment;
QQ	Defects or damage or deficiencies or other limitations	Brief details of conditions of the ship as relevant: ability to transfer cargo/ballast/bunker fuel;
RR	Description of pollution or possible overboard discharge	Brief details of pollution; this should include the type(s) of an estimate of the quantity discharged, whether the discharge is continuing, the cause of the discharge and, if possible, an estimate of the movement and area of slick.

Label	Function	Explanation
SS	Weather conditions	Brief details of weather and sea conditions prevailing including wind force and direction and relevant swell details;
TT	Ship's representative and/or owner	Name, address, telex and telephone number of the ship's owner and representative (charterer, manager or operator of the ship or their agents);
UU	Ship's size and type	Details of length, breadth, and type of ship as well as draught;
XX	Miscellaneous and additional information	Any other information including relevant details such a as brief details of incident, need for outside assistance, action being taken to limit further discharge; details of any personnel injuries sustained, details of P & I-Club and local correspondent.

All follow-up reports by the Master shall include information relevant to the Coastal State Authorities to keep them informed as the incident develops.

Follow-up reports shall include information on any significant changes in the ship's condition, the rate of release and spread of oil, weather and sea conditions and clean-up activities underway.

In this context details of bunker disposition, condition of any empty tanks and nature of any ballast carried are information needed by those involved in order to assess the threat posed by an actual or probalble discharge of oil from the damaged ship

EXAMPLE OF INITIAL REPORT

SHIP NAME, CALL SIGN, FLAG (AA)

Example ship A A A A, NOR

BB DATE OR TIME OF EVENT, UTC (BB)

_ 0 _ _3 _ _ 1 _ 0 _ _ _ 3 _ _0 _
Day of month Hours Minutes

CC POSITION, LAT, LONG (CC)

_ 6 _ 3 _ _2 _0 _ N__
Degree Minutes

_ 6 _ 3 _ _2 _0 _ N__
Degree Minutes

BEARING, DISTANCE, FROM LANDMARK (DD)

___ ___ ___ _ 1.0 _
Bearing Nautical miles

EE COURSE

_ 5 _ _ 5 _
Degree

SPEED, KNOTS (FF)

_1_ _0_ _9 _
kn kn 1/10

LL INTENDED TRACK, ROUTE (LL)

KRISTIANSUND N. – TRONDHEIM, NORWAY

MM RADIO STATION(S) GUARDED (MM)

CHANNEL 16

NN DATE AND TIME OF NEXT REPORT, UTC (NN)

_ _ _ _ _ _ _ _ _ _ _ _
Day of month Hours Minutes

PP TYPE AND QUANTITY OF CARGO/BUNKERS ON BOARD (PP)

D.O. 80 CST. 10 tons

OO BRIEF DETAILS OF DEFLECTS/DEFICIENCIES/DAMAGE

DB TK No. 1 HULL

RR BRIEF DETAIL OF POLLUTION, INCLUDING ESTIMATE OF QUANTITY LOST

2 tons lost, round the ship

SS BRIEF DETAIL OF WEATHER AND SEA CONDITIONS (SS)

DIRECTION W _ 1 _ _ 4 _ DIRECTION W _ 0 _ _ 0 _ 8 _
WIND SWELL
SPEED (Beaufort) HEIGHT (m)

INITIAL REPORT

SHIP NAME, CALL SIGN, FLAG (AA)

DATE OR TIME OF EVENT, UTC (BB)

___ ___ ___ ___ ___ ___
Day of month Hours Minutes

POSITION, LAT, LONG (CC)

___ ___ ___ ___ N S
Degree Minutes

___ ___ ___ ___ E W
Degree Minutes

BEARING, DISTANCE, FROM LANDMARK (DD)

___ ___ ___ ___ ___
Bearing Nautical miles

COURSE (EE)

___ ___ ___
Degree

SPEED, KNOTS (FF)

__ __ __ __ __ __
kn kn 1/10

INTENDED TRACK, ROUTE (LL)

RADIO STATION(S) GUARDED (MM)

DATE AND TIME OF NEXT REPORT, UTC (NN)

___ ___ ___ ___ ___ ___
Day of month Hours Minutes

TYPE AND QUANTITY OF CARGO/BUNKERS ON BOARD (PP)

BRIEF DETAILS OF DEFLECTS/DEFICIENCIES/DAMAGE (OO)

BRIEF DETAIL OF POLLUTION, INCLUDING ESTIMATE OF QUANTITY LOST (RR)

BRIEF DETAIL OF WEATHER AND SEA CONDITIONS (SS)

DIRECTION W ___ ___ DIRECTION ___ ___ ___
WIND SWELL
SPEED (Beaufort) HEIGHT (m)

SS BRIEF DETAILS OF WEATHER AND SEA CONDITIONS

DIRECTION		DIRECTION	
WIND		SWELL	
SPEED	(Beaufort)	HEIGHT	(m)

TT DETAILS ABOUT OWNER'S CONTACTS / OPERATOR / AGENT

UU SHIP'S SIZE AND TYPE

LENGTH: (M) BREADTH: (M) DRAUGHT: (M) TYPE:

XX ADDITIONAL INFORMATION

BRIEF DETAILS ABOUT THE INCIDENT:

NEED FOR OUTSIDE ASSISTANCE:

WHAT KIND OF ACTIONS HAVE BEEN TAKEN:

NUMBER OF CREW MEMBERS AND DETAILS OF ANY PERSONNEL INJURIES SUSTAINED:

DETAILS OF P & I-CLUB AND LOKAL CORRESPONDENT:

MISCELLANEOUS:

Footnote: The alphabetic reference letters in above form are taken from IMO resolution A. 648 (16) "General Principles for Ship Reporting Systems and Ship Reporting Requirements, including Guidelines for Reporting Incidents Involving Dangerous Goods, Harmful Substances and/or Marine Pollutants". The alphabetic reference letters are not in complete consecutive alphabetic order since certain letters have been used as reference in other standard report forms, i.e. letters used to state intended route.

2.2.3 WHO TO CONTACT

The Master is responsible for reporting any incident involving an actual or probable discharge of oil.

Taking into consideration the summary flowchart the Master involved in any kind of an actual or probable discharge of oil, cases of which are defined under **SECTION 2** (sub-paragraphs 2.2.1.1 and 2.2.1.2) of this Plan should report details of the incident immediately.

The report sheet on page 15 – 16 (section 2) shall be used in every incident.

Nothing in this chapter relieves the Master from using sound judgement to make sure that any incident is reported as quickly as possible in the prevailing situation.

2.2.3.1 COASTAL STATE CONTRACT

(Complete contact list in SECTION 5, appendix I).

For the ship at sea

In order to expedite response and minimize damage from an oil pollution incident, it is essential that appropriate Coastal States being notified without delay.

In this context the use of the list of agencies or officials of Administrations responsible for receiving and processing report (so called ”focal points”) as developed by the Organisation (IMO) in conformity with article 8 of the Convention is recommended.

An updated list of existing ”focal points” is available from Flag State Authorities. These lists are supplied to the Master from owners for filling into this manual.

2.2.3.2 PORT CONTRACTS

(Complete list in SECTION 5, appendix H and I).

When the ship is in port, notification of local agencies, combating teams or clean-up companies will speed response. If an oil spill occurs during the ship's stay in a port, whether operational or as a result of an accident, the Master shall inform the appropriate local agencies (e.g. National Response Centre, Terminal/Port Authorities etc.) without undue delay.

If change in addresses of persons/authorities of the port/terminals or new ports/terminals the Master will receive information from the owner or local agent.

Where ship's service make it not feasible to prepare such a list the Master shall seek guidance concerning such local Port Contracts or local agent and local reporting procedures upon arrival in port.

Addresses obtained in this way should be documented aboard in the form that the Master considers most effective and should be attached to the Plan.

2.2.3.3 SHIP INTEREST CONTRACTS

In case of oil spill actual or probable, the Master shall inform the home office, P & I Club correspondent, local agent.

These contacts are sampled in a so-called "Ship Interest Contact List". The list is shown in section 5, appendix G.

3 STEPS TO CONTROL DISCHARGE

The Plan is to provide the Master with guidance on how to accomplish this mitigation for a variety of situations.

The Master is responsible to initiate a response in the event of a discharge of oil, actual or probable, into waters.

The Master shall, in no case, take actions which could jeopardise the safety of personnel either onboard or ashore.

The following enumeration specifies different kinds of operation oil spills with regard to reactions to be taken.

3.1 OPERATIONS SPILLS

3.3.1 OPERATIONAL SPILL PREVENTION

Crewmembers shall maintain a close watch for the escape of oil during bunker operations. The chief engineer is in charge for bunkering operations.

Prior to bunker transfer the competent crewmembers shall mobilise the oil spill equipment and place it close to the planned operation, e.g. along the railing in the area where bunker operation takes place.

Before bunker handling commences, all deck scuppers and open drains must be effectively plugged. Accumulations of water should be drained periodically and scupper plugs replaced immediately after the water has run off. Any free floating oil or droplets should be removed prior to draining.

Bunker tanks, which have been topped up, should be checked frequently during the remaining bunker operations to avoid an overflow.

3.1.2 PIPELINE LEAKAGE

If leakage occurs from a pipeline, valve, hose or metal arm, operations through that connection should be stopped immediately until the cause has been ascertained and the defect remedied.

Isolate defective pipe section. Affected section should be drained down to an available empty or slack tank.

If a leakage occurs from a hydraulic pipeline, operations should be stopped immediately.

Initiate clean-up procedures.

The removed bunker oil and the used clean-up material should be retained on board until it can be discharged to a reception facility.

Inform in line with **SECTION 2** all parties interested about **Pipeline Leakage** and the actions taken so far.

3.1.3 TANK OVERFLOW

If there is tank overflow all bunker operations should be stopped immediately and should not be restarted until the fault has been rectified and all hazards from the released oil have been eliminated.

If there is any possibility of the released oil or oil vapours entering an engine room intake appropriate preventive steps must be taken quickly.

Promptly transfer bunker oil from the tank that overflowed to an available empty or slack tank or prepare pump(s) or transfer the excess ashore.

Initiate clean-up procedures.

The removed bunker oil and the used clean-up material should be retained on board until it can be discharged to a reception facility.

Inform in line with **SECTION 2** all parties interested about **Tank Overflow** and actions taken so far.

3.1.4 HULL LEAKAGE (Double Bottom Bunker tanks and other Bunker tanks)

Identify leaking tank; consider diver if necessary and possible.

If there is a spillage due to suspected hull leakage, reduce the head of bunker and promptly transfer the bunker oil to an available empty or slack tank or, if berthed, discharge ashore in suitable barges/tanks.

Inform in line with **SECTION 2** all parties interested about **Hull Leakage** and the actions taken so far.

3.1.5. SPILL CAUSED BY EQUIPMENT IN MACHINERY SPACES

If operational oil spills are caused by a failure of equipment in machinery spaces, any further operations of this equipment should be stopped immediately or measures are to be taken to avoid an oil spill.

Such equipment may be

- oily-water separating equipment or oil filtering equipment to deoil bilge water from the engine room bilges,
- valves in pipes connecting ballast/bilge systems,
- gearing of bow thrusters,
- stern tubes.

3.2 SPILLS RESULTING FROM CASUALTIES

In the event of a casualty, the Master's first priority is to ensure the safety of the ship's personnel, and to initiate actions which may prevent escalation of the incident and marine pollution.

3.2.1 GROUNDING

The Master's priority should be to ensure that he as soon as possible receives detailed information about the damage that the ship has sustained, in order to determine remedial action to be taken for ensuring the safety of the ship and its crew.

Furthermore, the Master should also consider

- Danger to the ship's complement if the ship should slide off grounding site;
- Danger of ship being shattered by heavy seas or swell;
- Health hazards to the ship's crew and surrounding population due to release of oil or other hazardous substances in dangerous concentrations;
- That fires may start due to released flammable substances and uncontrolled Ignition sources.

Should the damage which the ship has sustained, be of such an extent that the stability cannot be computed on board, the Master should seek assistance according to subparagraph 3.3.

Also, the ship's Master shall take into account the following considerations:

- Is the vessel constantly being struck in the seaway?
- Is the vessel exposed to torsion?
- Is there a large difference in the tidal range at the grounding site?
- Are there strong tidal currents in the grounding area?
- May the vessel drift further up on the shore due to high tides, wind, and waves?

3.2.1.1 PREVENTION OF FIRE AND EXPLOSION

If the ship is aground and therefore cannot manoeuvre, all possible sources of ignition should be eliminated and action taken to prevent flammable vapours from entering the machinery spaces or the accommodation.

3.2.1.2 EXTENSION OF HULL DAMAGE

First, a visual inspection should be carried out. Both hull and machinery side.

Check for visible oil along hull or in wake of the ship during daytime. At night a stick with white cloth (or sheet of sorbet) around it may be lowered into the water alongside the ship to check for oil leakage.

All ballast/bunker tanks to be sounded (ullage).

All other compartments, which have contact with the sea, should be sounded to ensure that they are intact.

Sounding must be carried out around the ship to establish the ship’s position on the grounding area.

When the ship is aground, due regard should be given to the indiscriminate opening of ullage plugs, sighting ports, etc. as loss of buoyancy could be the result of such actions.

Any list of the ship shall be noted and included in the report for assistance.

3.2.1.3 PROCEDURES TO REDUCE OR STOP OUTFLOW OF OIL

The Master should assess the possibility of damage to the environment, and whatever action can be taken to reduce further damage from an oil release, such as:

- Transfer of bunkers internally provided shipboard piping system is in an operational condition;
- If the damage is fairly limited and restricted, i.e. to one or two tanks, consideration should be given to transfer of bunkers internally from the damaged tank(s) to intact tanks, taking into account the impact on the ship's overall stress and stability;
- Isolate damaged/penetrated bunker tank(s) hermetically to ensure that hydrostatic pressure in tanks remains intact during tidal changes;
- Evaluate the possibility of additional release of oil.
  In case of large differences between the tide levels, the Master should try to isolate the damaged tank(s) to reduce additional loss of bunker oil.

3.2.1.4 REFLOATING BY OWN MEANS

The Master should also evaluate the question of refloating the vessel by own means. Before such an attempt is made, it must be determined:

- Whether the ship is damaged in such a way that it may sink, break up or capsize after getting off;
- Whether the ship after getting off may have manoeuvring problems upon leaving the dangerous area by own means;
- Whether machinery, rudder or propeller are damaged due to grounding or may be damaged by trying to get off ground by own means;
- Whether the ship may be trimmed or ligtened sufficiently to avoid damage to other tanks in order to reduce additional pollution from oil/bunker spillage;
- Weather evaluation: Whether there is time/reason to await improvements in weather tide.

3.2.1.5 SECURING THE SHIP

If the risk of further damage to the ship is greater in an attempt to refloat the ship by own means, than in remaining aground until professional assistance has been obtained, the ship's Master should try to secure the ship as much as possible by:

- Trying to prevent the ship in moving from its present position;
- By dropping anchors (adequate water depth and anchor ground provided):
- By taking ballast into empty tanks, if possible;
- Trying to reduce longitudinal strain on hull by transferring ballast or bunkers internally;
- Reducing fire risk by removing all sources of ignition.

Inform in line with **SECTION 2** all parties interested about the **Grounding** and the actions taken so far.

3.2.2 FIRE / EXPLOSION

Should an explosion and a fire occur on board, sound the **GENERAL ALARM** immediately.

Further actions should be initiated in accordance with the ship's **Muster List**.

In case of fire and explosion the following priorities exist:

- Rescuing lives;
- Limiting the damage / danger to the ship and cargo;
- Preventing environment pollution.

Steps to control the discharge of oil will depend largely on the damage to ship and cargo.

Special information thereto is contained in subparagraph 3.2.4, 3.2.5, and 3.2.6.

Inform in line with **SECTION 2** all parties interested about the **Fire / Explosion** and the actions taken so far.

3.2.3 COLLISION

Should the ship be involved in a collision with another ship, the Master should as soon as possible identify the extent of damage to his own vessel.

When a collision occurs, the **GENERAL ALARM** should be sounded immediately for the personnel to muster at their designated **Muster Stations**.

The following check list should assist the Master in assessing the situation:

- Are any tanks penetrated above or below the waterline?
- If ships are dead in the water and interlocked, what is most prudent, to stay interlocked or separate?
- Is there any oil spill at present – mall or large? Will a separation of the interlocked ships create a larger oil spill than if the ships stay interlocked?
- If there is an oil spill, will the separation of the ships cause sparks that can ignite the spilled oil or other flammable substances leaked out from the ships?
- Are the ships creating a greater danger to other traffic in the area if they are interlocked than if separated?
- Is there a danger to either ship of sinking after being separated?
- If the ships are separated, how is the manoeuvrability of the ship?

If separation of the ships take place, alter course to bring the own ship windward of any oil slick, if possible.

Shut down all none essential air intakes.

Isolate damaged/penetrated tank(s) by hermetically closing the tank(s), if possible.

When it is possible to manoeuvre, the Master, in conjunction with the appropriate shore authorities, should consider moving his ship to a more suitable location in order to facilitate emergency repair work or lightening operations, or to reduce the threat posed to any sensitive shoreline areas.

Inform in line with **SECTION 2** all parties interested about the **COLLISION** and the actions taken so far.

3.2.4. HULL FAILURE

Should the ship loose one or more shell plating, develop major cracks, or suffer severe damage to the hull, the Master should immediately sound the **GENERAL ALARM** to call the crew members to their Muster Stations, and inform them of the situation, and prepare lifeboats/raft for launching if necessary.

The Master should then assess the situation, and confer with his senior officer.

The Master should obtain the latest weather forecast, and assess its impact on the present situation.

Furthermore, the following questions should be considered and should be asked:

- Is the ship in any immediate danger of sinking or capsizing?

If **YES**:

- Send distress message;
- Immediately abandon the ship;

If **NO**, initiate damage control measures as found necessary by considering the following points:

- Can the vessel manoeuvre on its own?
- Has the ship lost buoyancy?
- If the ship has a list due to loss of ballast, cargo/bunker or buoyancy, is it necessary and possible to rearrange the bunker or ballast by internal transfer operation in order to bring the ship to an even keel?
- Is it necessary to dump cargo in order to maintain stability without changing the stress situation?
- Can the change in the ship's stability and stress situation be monitored and calculated on board? If not, the Master should seek assistance according to subparagraph 3.3.
- Does the ship need assistance or escort to nearest port of refuge or repair port?
- Might it be prudent to salve part of the crewmembers in case the situation should worsen, or is it necessary to abandon the ship totally?

Inform in line with **SECTION 2** all parties interested about the **Hull Failure** and the actions taken so far.

3.2.5 EXCESSIVE LIST

Should the ship for some reasons suddenly start to list excessively during discharging/loading operations, or bunkering, all ongoing operations should be stopped immediately until the cause has been determined.

The Officer on duty should inform the Master without any delay.

The Master, together with his officers, should try to determine the reason for the excessive list. Following procedures are required:

- Check reason(s) for list;
- Sounding/ullage to be taken in all tanks;
- Bunker/ballast pumps to be made ready;
- Consider measures to minimise list in transferring liquid from one compartment to another;
- Ensure water tightness of empty spaces;
- Close all openings;
- Secure vent pipes to avoid ingress of water;
- If bunkering: Change to corrective tanks for rectifying the situation;
- If ballasting/deballasting: Change to corrective tanks to rectify the situation;
- If there is reason to believe that the list may cause an oil spill, notify as per **SECTION 2**.
- If the ship's crew is in jeopardy, prepare lifeboats for launching, and notify as per **SECTION 2**:

If the situation is brought under control, inform all parties interested.

3.2.6 TRANSFER OF BUNKER/LIGHTENING

If the ship has sustained extensive structural damage, it may be necessary to transfer all or part of the bunker to another ship; however, this section refers to bunker transfer procedure only.

If the Ship-to-Ship-transfer operations involving a specialised service ship, the Master of that ship will normally be in overall charge.

In case of non-specialised ships the Master or other person in overall charge of the operation should be mutually agreed and clearly established by the Master concerned prior to start of operations.

The actual bunker transfer should be carried out in accordance with the requirements of the receiving ship (specialised service ship).

In all cases each Master remains responsible for the safety of his own ship, its crew, cargo/bunker and equipment and should not permit their safety to be jeopardised by the action of the other Master, his owner, regulatory officials or others.

The Ship-to-Ship transfer operation should be co-ordinated with the appropriate responsible local Authority.

Before operation start, the Master(s) should be agreed in the following points:

- satisfactory communication between both ships is established,
- if the master and officers of the tow ships are of different nationalities communications shall be in common language,
- Personnel involved in transfer operation shall at all times have reliable means of communication,
- a breakdown in communication during transfer operation shall be indicated by an agreed emergency sounding signal, and the transfer of bunker shall immediately be suspended,
- the need to notify and obtain the agreement of any responsible authority,
- the shelter provided, particularly from sea and swell, if possible,
- the weather conditions and the weather forecasts.

Further, before commencing Ship-to-Ship transfer operations each ship should carry out, as far as possible, appropriate preparations like

- pre-mooring preparations of the ships,
- positioning of fenders if such equipment is available on board,
- mooring equipment arrangements.

3.3 DAMAGE STABILITY AND HULL STRESS CALCULATION

If the ship is affected by non-operation spills, cases of which are mentioned under **SECTION 3**, subparagraph 3.2, and it is necessary to move cargo or bunker to mitigate the problem, the Master should calculate all relevant stability and hull stress parameters prior to commencement of any bunker movement.

Stability book is available

- in the Master’s office.

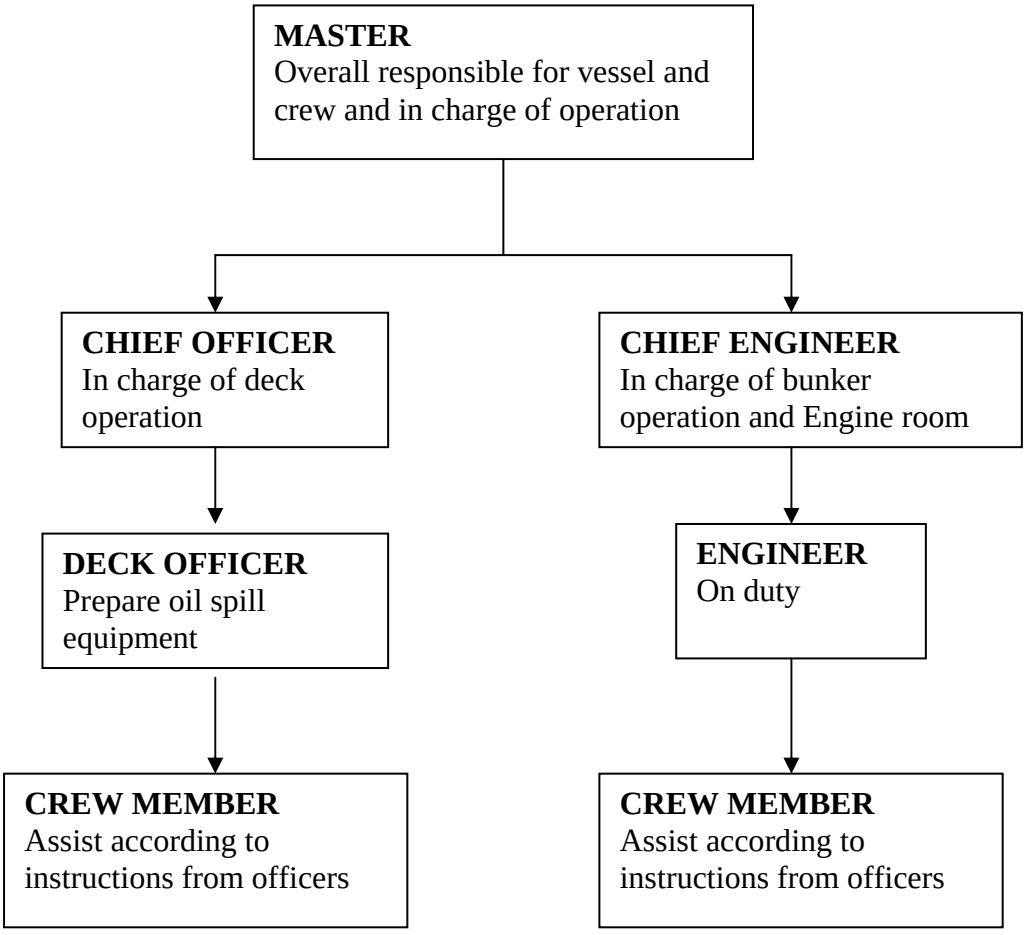
If there is any doubt regarding the safety of the planned operation, a request for assistance from the home office for further information.

On page 33-34 summary check list has been made for quick reference.

3.4 GENERAL RESPONSIBILITY

The following officers and crewmembers are in charge in the event of an oil spill – actual or probable – to bring the accident under control, limit outflows, organise on board clean-up procedures and determine the additional manpower needed.

SUMARY FLOWSHEET



3.4.1 OPERATION OIL SPILL RESPONSE CHECK LIST

ACTION TO BE TAKEN	ACTION TAKEN		PERSONS RESPONSIBLE
	YES	NO	
IMMEDIATE ACTION			
1. Sound emergency plan			Person discovering incident
2. Initiate vessel emergency response procedures			Officer on duty
INITIATE RESPONSE			
1. Cease all cargo and/or bunkering operations			Officer on duty/Ch.eng.
2. Close manifold valves			Engineer on duty
3. Stop air intake to accommodation			Officer on duty
4. Stop non-essential air intake to engine room			Engineer on duty
5. Locate source of leakage			Officer on duty
6. Stop or reduce flow of oil			Officer on duty
7. Commence clean up procedure using absorbents and permitted solvents			Officer on duty
8. Comply with reporting procedures			Master
SECONDARY RESPONSE			Chief officer
1. Assess fire risk from release of flammable substanses			Chief engineer
2. Reduse oil level in relevant tank by pumping into an empty tank or slack tank			Chief engineer Chief engineer
3. Reduce level of oil in tanks in suspected area			Chief engineer
4. Drain effected line to empty or slack tank			
5. Prepare pumps for transfer of oil, to shore or lighter			Chief engineer
6. Prepare portable pumps if it is possible to transfer spill oil to empty tank.			
FURTHER RESPONSE			
1. Pump water into leaking tank to create water cushion and prevent further oil loss			Chief engineer Master
2. If leakage is below water line arrange divers for further investigation			Chief officer
3. Calculate stresses/stability			Chief officer
4. Transfer bunkers to alleviate high stresses			
5. Stow residues from clean-up carefully prior to disposal.			

3.4.2 CASUALTY OIL / SPILL RESPONSE CHECK LIST

ACTION TO BE TAKEN	ACTION TAKEN		PERSON RESPONSIBLE
	YES	NO	
IMMEDIATE ACTION			
1. Sound emergency plan			Person discovering incident
2. Initiate vessel emergency response procedures			Officer on duty
INITIATE RESPONSE			
1. Stop air intake to accommodation			Officer on duty
2. Stop non-essential air intake to engine room			Officer on duty
3. Assess further danger to ship or personnnel by such as capsize or immediate sinking			Master
4. Cease all cargo and other non-essential operations			Officer on duty
5. Assess whether oil has actually been spilt/there is a probability that it will be spilt			Officer on duty Master
6. Comply with reporting procedures			Chief officer
7. Sound all compartments			Chief officer
8. Sound around vessel if agraound			Master
9. Request outside assistance			Chief officer
10. Stop or reduce flow of oil			Chief officer
11. Counter excessive list			Officer on duty
12. Contain spilt oil			
13. Commence clean up procedure using absorbents and permitted solvents			Chief officer
FURTHER RESPONSE			
1. Assess fire risk from release of flammable substances			Chief officer
2. Consider evacuation of non-essential crew			Master
3. Assess likelihood of further damage to vessel or cargo			Master
4. Calculate stresses/stability			Chief officer
5. Transfer bunkers to alleviate high stresses			Chief officer
6. Request assistance or escort to port of refuge			Master
7. Manoeuvre upwind of spill/away from land			Master
8. Assess whether tide will worsen the situation			Navigator
9. Obtain weather forecast			Master
10. Prepare pumps to transfer of bunkers, to other tanks or to shore or lightening vessel			Chief engineer

3.4.3 OIL SPILL EQUIPMENT

The equipment has to be in operational condition. It is the responsibility of the chief officer that the following equipment is placed on board at any time.

Following equipment is on board:

-	Bilge Water Separator	placed in Engine room
1.	Sawdust in bags	placed in the deck store
2.	Spades (to remove oil spill)	placed in the deck store
3.	Brooms / brushes (to remove oil spill)	placed in the deck store
4.	Empty barrels for storing oil spill	placed in the deck store
5.	Plugs of wood for plugging the drains on deck, to be used during bunker operations	placed in the deck store
6.	1 bag of rags for tightening of the drains on deck and wiping up oil on surface	placed in the deck store

The oil spill is to be depoted on an on-shore suitable location or oil spill reception**.**

3.4.4 RECORD OF OIL POLLUTION PREVENTION DRILLS

Drills shall be carried out regularly. The owner is recommending that drills are carried out at least each month. Also, drills shall be carried out no less than one week after new personnel has been employed onboard the vessel. All drills are to be recorded in the sheets below. In addition the drills are to be recorded in the deck logbook.

RECORD OF OIL SPILL DRILLS

DATE	DRILLS / USE OF OIL SPILL EQUIPMENT	SIGNATURE

4 NATIONAL AND LOCAL CO-ORDINATION

Quick, efficient co-ordination between the ship and Coastal States or other parties involved becomes vital in mitigating the effects of an oil pollution incident.

As the identities and roles of various national and local Authorities involved vary widely from state to state and even from port to port, the Master should take note of these particularities, as far as possible.
In this context the Master should call upon the owner's representatives in the state/port of question to receive the relevant information.

Prior to undertaking mitigation actions – especially in cases of an actual discharge of oil due to causalities in the territorial waters of a Coastal State – the Master should contact the Coastal State for authorisation of his actions.

The Master should co-ordinate all his activities with the Coastal State.

The Master should call the Coastal State for allowance to use chemical agents for response to oil pollution on the sea. Without authorisation of the Authorities of the appropriate Coastal State **no chemical agents should be used**.

Where no responsibility for discharge response by a Coastal State is noticed, the Master should take all the necessary steps as deemed appropriate to minimise the escape of oil.

With respect to the accident happened, the Master should take measures as stated in **SECTION 2** and **SECTION 3** of this Plan.

4.1 ADDITIONAL INFORMATION

Record Filing and Samples

All reporting shall be carried out according to subsection 2.2 and according to general requirements in the owner's quality manual. The vessel's Master shall keep in mind following requirements:

- All information, in full details, shall be recorded in deck logbook. This information shall contain name of persons, company names who assist the vessel, to whom information is sent, and shore based clean up organisation. Also effort made by the crew.

- Photos of important factors are most convenient.

- 2 samples of the oil spill shall be taken, if possible. The samples shall be properly marked and sealed. These samples shall be kept on board and only handed over to a duly authorised owner's representative, or harbour authority. This shall only be carried out in co-ordination with home office.

A General Arrangement Plan
B Fuel Oil System
C Ballast Drawing
D Tank Capacity Plan
E Bilge System
F Lubrication Oil System

G Ship Interest Contact List
H Port Contact List
I Coastal State Officials of Administration (World Wide) responsible for receiving and processing Reports
J Bibliography

COUNTRY	NAME, ADRESS, (CONTACT PERSON)	TELEPHONE FAX	REMARKS
NORWAY	Sanco Holding AS N-6083 Gjersvika, Norway	Tlf. +47 70 02 63 091 Fax. +47 95 70 60 32	OWNER
NORWAY	Gjensidige Drammensvg.288 Postboks 276 N-1326 Lysaker	Tlf. +47 22 96 80 00 Fax. +47 22 96 99 31 Emergency Telephone +47 47 88 18 90	P & I INSURANCE
NORWAY	Gard P.BOX 1563 4801 Arendal Norway	Tlf. +47 37 01 91 00 Fax. +47 37 02 55 99 24 Hour Emergency: tlf.: +47 90 52 41 00	P & I INSURANCE
NORWAY	SFT Statens Forurensings tilsyn Horten Norway	Tel. +47 33 03 48 00 Fax. +47 33 03 49 49	
NORWAY	SD Sjøfarts Direktoratet Oslo	Tel. +47 22 45 45 00 Fax. +47 22 56 87 80	
NORWAY	DNV Det Norske Veritas Oslo	Tel. +47 67 57 99 00 Fax.+47 67 57 99 11	

COUNTRY	NAME, ADDRESS, (CONTACT PERSON)	TELEPHONE FAX	REMARKS
NORWAY STAVANGER	RCC, South Norway (Rescue center)	Tel.+47 51 51 70 00 Fax.+47 51 65 23 34	
NORWAY BODØ	RCC, North Norway (Rescue center)	Tel.+47 75 52 12 67 /75 58 07 45 Fax.+47 75 52 42 00 Tlx. 00 56 64 293	
		Tel. Fax.	
		Tel. Fax.	
		Tel. Fax.	

- ”Guidelines for the Development of Shipboard Oil Pollution Emergency Plans” (IMO)

- ”Provisions concerning the Reporting of Incidents involving Harmful Substances under Marpol 73/78” (IMO)

- ”Ship to Ship Transfer Guide”
  Oil Companies International Maritime Forum (OCIMF)

- ”Response to Marine Oil Spills”
  International Tanker Owner Pollution Federation (ITOPF)

- ”Peril at Sea and Salvage – A Guide for Masters”
  International Chamber of Shipping and Oil Companies (ICS/OCIMF)

Appendix 4. SOPEP Approval

DET NORSKE VERITAS

DET NORSKE VERITAS AS
DNV Maritime, Region Nordic Countries, the Baltic and Germany
Statutory
Veritasveien 1
1322 Høvik
Norway
Tel: +47 67 57 99 00
Fax: +47 67 57 99 11
http://www.dnv.com
Org. No: NO 945 748 931 MVA

Vaagland Båtbyggeri AS
6683 VÅGLAND
Norway

Att: GUDMUND E. HILLESTAD

Your ref.:	Our ref.:	Date:
	MNBNA843/EGIL/D28166-J-360	2009-04-28

"SANCO SPIRIT" - VAAGLAND BÅTBYGGERI AS 141, Id.No. D28166

Reference is made to your letter dated 2009-03-18. Please find enclosed 3 copies of the following document (SOPEP front page) stamped 2009-04-28:

Drawing No.	Rev.	Title	Code	Status
141102105	A	Shipboard Oil Pollution Emergency Plan (SOPEP)	950.11	Approved

Drawing No. 141102105/ A, "Shipboard Oil Pollution Emergency Plan (SOPEP)" is approved in accordance with the requirements of MARPOL 73/78, Annex I, Reg.37 in compliance with amended IMO Resolution MEPC.86(44).

You are kindly requested to forward the vessel one complete approved SOPEP.

Our file is updated accordingly.

Yours faithfully
for DET NORSKE VERITAS AS

Alf Roger Skevig
Head of Section
MARPOL

Egil Andresen
Contact Person

Copy to : DNV Kristiansund N

DET NORSKE VERITAS

DNV Id No.: **28166**

SHIPBOARD OIL POLLUTION EMERGENCY PLAN (SOPEP)

This manual is approved by Det Norske Veritas AS
on behalf of the government of

GIBRALTAR
(Gibraltar is an overseas territory of the United Kingdom)

The plan includes the requirements of MARPOL 73/78,
Annex I, Reg. 37.

Name of ship: **"SANCO SPIRIT"**

IMO number: **9429936**

IF CHANGING VESSEL'S OWNERSHIP / MANAGEMENT
THIS PLAN IS SUBJECT TO REVISION AND RE- APPROVAL

DET NORSKE VERITAS * 1864 *
APPROVED
2009 -04- 28
SIGN.:
DET NORSKE VERITAS AS
Høvik

Appendix 5. Vessel: Sanco Spirit

M/V SANCO SPIRIT

YOUR PARTNER IN MARINE SEISMIC OPERATIONS

TECHNICAL SPECIFICATION FOR M/V SANCO SPIRIT

Built:	2009
Length:	86,50 M
Breadth:	16,00 M
Gross Tonnage:	4396 T
Helideck:	D-Value, 20 M, 11 T
Accommodation:	47 persons

Sanco Shipping AS | Industriparken | N-6083 Gjerdsvika | Norway | Tel +47 70 02 63 90 | Fax +47 70 02 63 99 | Email: office@sanco.no
www.sanco.no

TECHNICAL SPECIFICATION FOR M/V SANCO SPIRIT

MAIN DIMENSIONS	
Length O.A:	86,50 M
Length P.P:	79,60 M
Breadth:	16,00 M
Draft loaded:	5,80 M
Draft in ballast:	4,50 M
Moulded depth:	6,50 / 7,70 M
Air draft:	31,00 M
Gross Tonnage:	4396 T
Deadweight:	2200 T
Net Tonnage:	1319 T

PROPULSION MACHINERY	
Main propulsion:	STADT Stascho, 2 x 2500 kW, 690V
Main generators:	4 x 1593 kW, ABC Diesel, 8 DZC, 900 RPM
Main Gear:	2 x Finnøy
Generators:	4 x AVK , 1612 kW each.
Propeller:	2 x 4 bladed Finnøy, Ø= 3100, 150 / 190 RPM

AUXILLIARY MACHINERY	
Seismic compressors:	2 x Neuman & Esser, 2200 cfm each
Emergency Aux.:	1 x Scania, 352 kW
Bow thruster 1:	1 x Brunvoll tunnel , 700 kW
Bow thruster 2:	1 x Brunvoll azimuth , 700 kW
Stern thruster 1:	1 x Brunvoll tunnel , 700 kW
Rudders:	2 x Hince Flaprudder
Steering Gear:	2 x RR Tenfjord

CAPACITIES	
Marine Gas Oil (MGO):	1100 m3
Drinking water:	117 m3
Helideck:	D-value 20 meter, 11 Tonnes

NAVIGATION & COMMUNICATION EQUIPMENT	
HF/MF/DSC	Sailor 4000
VHF	3 x Sailor
VHF, portable	3 x Sailor SP 3300
UHF	5 x Motorola GP 340
Radar 1	3 cm Furuno FR 2117, Arpa
Radar 2	10 cm Furuno FR 2137 S, Arpa
Gyro	2 x Simrad GC80
GPS gyro	Furuno SC-50
GPS	2 x Furuno GP-150
El.Chart Ecdis	2 x Telchart 2026
DP system	Kongsberg Kon-Pos.
Doppler log	Furuno DA-80
Navtex	Furuno NX-700 B
Wheterfax	Furuno FAX 30
Autopilot	Kongsberg with track steering
Auto. Id. System	Furuno FA-150 AIS
Epirb	2 x Sailor SE-406 II
Sart	2 x Tron sart
Mini-M	Sailor SP4146A
Sat C	2 x Sailor H2095C
Echo sounder	Furuno FE-700
E-mail in spare:	spirit@emailadvanced.com
E-mail to be used:	bridge.spirit@sanco.no
Sat phone V switchboard:	+ 31 107130612 (13) (14)
Mini M Sat tlp:	+ 870 7649469 68 (69)

CLASS	
DNV + 1A1, ICE-C, HELDK-SH, RP, EO, DYNPOS-AUTR.	
Built:	Vaagland Båtbyggeri AS, Norway, build no. 141, Year 2009
Call sign:	ZDJN 3
Flag:	GIBRALTAR
Port of register:	GIBRALTAR
IMO Number:	IMO 9429936
DNV ID Number:	28166
MMSI Number:	236538000

SPEED & CONSUMPTION	
Max speed:	15 knots = 27 m3/ day
Service speed:	13 knots = 17 m3/ day
Bollard pull:	45 tonnes at 4,5 knots

DECK MACHINERY	
Deck crane midship:	1 x Triplex folded jib crane, SWL 5 tonnes at 15 meter
Provision crane:	2 x Triplex crane, SWL 1,5 tonnes at 6 meter
Gun winches:	7 pcs
Streamer winch:	4 pes + 8000 M
Incinerator:	Teamtec Golar OG 400

ELECTRIC POWER
690 V, 440 V, 230 V all 60 Hz

RESCUE EQUIPMENT	
MOB-boat:	1 x with diesel engine and water-jet, approved for 10 persons
Liferafts:	6 x 25 persons
Lifesaving capacity:	47 persons

ACCOMMODATIONS
13 x 1 bed cabin with bathroom
17 x 2 bed cabin with bathroom
Hospital with bathroom
3 x dayrooms + 1 conference room + Internet café
Gymnasium

MANAGEMENT COMPANY	
Sanco Shipping AS	
Industriparken	
N-6083 Gjerdsvika, NORWAY	
Telephone:	+47 700 26 390 Mobile: + 47 95706032 / + 47 90976808
Telefax:	+47 700 26 399
E-mail:	office@sanco.no
Internet:	www.sanco.no

ALL SPECIFICATIONS GIVEN WITHOUT GUARANTEE AND SUBJECT TO CHANGES
Updated: May 2010

Appendix 6. Minutes of Public Meetings

Consultations in May 2011
In support of Multi Klient Invest (MKI) AS
2D Seismic Survey Offshore Baffin Bay

Arthur: Darlene Davis
RPS Energy
Project Manager

Date: May 27, 2011

1. INTRODUCTION 3
1.1 BACKGROUND 3
2. CONSULTATIONS 4
2.1 POND INLET 4
2.1.1 Comments and information shared during the discussions 4
2.1.2 Conclusions 7
2.2 CLYDE RIVER 9
2.2.1 Comments and information shared during the discussions 10

1. INTRODUCTION

RPS Energy, Canadian lead consultancy for the MKI potential 2D Seismic Survey offshore Baffin Bay and Davis Strait, organized public meetings in Pond Inlet and Clyde River to share information on the potential 2D Seismic Survey, to support the recent Environmental Assessment submitted to NEB and currently under review. MKI is a wholly owned subsidiary of Petroleum GeoServices (PGS). TGS Nopec and PGS have entered into a joint venture for this program.

1.1 BACKGROUND

In November 2010, RPS Energy began organizing meetings with provincial and territorial groups in Iqaluit. Meetings took place in January 2011 to establish a basis for meaningful consultations with the Hunters and Trappers Organization. The approach that was taken was to arrange in person meetings with the HTO groups in several communities.

The HTO groups have election of members in December 2010; unfortunately, meetings could not be set up prior to February 2011. In February, RPS Energy traveled to Clyde River, Pond Inlet, and Qikiqtarjuaq. Pangnirtung was to be included in these visits, however, due to the lack of an HTO manager in Pangnirtung, efforts to meet proved unsuccessful at this time

Public meetings were offered in Clyde River, Pond Inlet, Qikiqtarjuaq, and Pangnirtung for early April. Due to a lack of response, and ability to confirm suitable timing with regards to the public meetings, RPS spoke with Qikiqtani Inuit Association (QIA) and it was recommended by Nigel Qaumariaq that we pick our own date and announce that we will be presenting. With this approach in mind, meetings were scheduled in early May with Pond Inlet, Clyde River, and Qikiqtarjuaq. We were still working with new HTO in Pangnirtung to establish a meeting date.

Originally, Clyde River was May 25th and Pond Inlet May 26th; however, Pond Inlet later announced that they had a public meeting scheduled with DFO on that night and Clyde River had no accommodations. Again, due to the election in Clyde River they did not want public meeting on election night. Fortunately, we were able to switch Pond Inlet to May 25th and Clyde River to May 26th and follow through with the meetings.

In Clyde River, we were able to find accommodations in the Council House, as the hotel is booked until October 2011 with construction workers building new homes in the area.

These are some of the many challenges when working in the North. Efforts are continuing for a public meeting in Qikiqtarjuaq and Pangnirtung in early July before the possible start of the project.

2. CONSULTATIONS

2.1 POND INLET

Community:	Pond Inlet
Date:	May 25th, 2011
Location:	Anglican Parish Hall
Duration:	7:00pm-9:30pm

Darlene Davis, Project manager from RPS Energy on behalf of PGS/TGS, and Dave Hedgeland, Environmental Manager for PGS, facilitated this meeting by beginning with a thirty minutes presentation to explain the program and followed by questions and concerns from the attendees.

There were 12 members from the community in attendance; in addition Nigel Q from the QIA was invited and in attendance, and a couple of the HTO members present in the previous meeting.

1.	Gileb Sangoya	MHTO
2.	David Qaiuaniq	CLARC
3.	Leah Tagak	MHTO
4.	Dan Komanfapik	MHTO
5.	T. Ootook	
6.	Joel Nashool	L.R.C.
7.	P. Elidinh.	
8.	Sam Eorlaloo	
9.	Mary Poph	
10.	Rebecca Takawgak	
11.	Simennie Ootoova	
12.	Shlas Takawgak	
13.	Nigel Qaumariaq	QIA

2.1.1 Comments and information shared during the discussions

- **Question**: Gibel shared that he knows that Narwhals have been tagged for study purposes and wanted to know if this has been done for mammals and seals, as they get harmed from sound.
- **Answer**: PGS Environmental Manager shared that he is not aware of any studies that show that animals/ different species concluded to cause harm from seismic sound.

- **Question**: Wanted to know what the safe distance is for the mammals? He shared that he knows for a fact that polar bears get damage to their

hearing from dogs, out of the water. In the water, sound is louder, and during World War II, un-exploded ordinates left in the water and within a 5 miles radius all the fish died.

- **Answer**: The safety zone established based on the "Statement of Canadian Practice" was explained, and indicated they would need to be in the safety zone to be harmed. That is why the 500m is there, so that if a mammal is inside they shut down the air guns.

- **Question**: He then asked, what about mammals under the surface? When they are under the water can you detect them?
- **Answer**: It was mentioned that there are ways to listen for marine mammals; is there an opportunity to test the system. (Passive Acoustic Monitoring).

- **Question**: Until ice break up, bearded seals are birthing under water. Would a microphone in the water help you to hear them? And would you know how far they are?
- **Answer**: It was explained that Passive Acoustic Monitoring is not very accurate at determining distance.

- **Question**: Environmental Manager for PGS asked if there were particular places seals are birthing.
- **Answer**: Response was usually in March, April, and May. The further north you go the later the birthing. That is almost the same month every year.

- **Comment**: Gibel pointed out that his personal knowledge comes from living in Craig Island and all the lands in between. He knows for a fact, "that sound doesn't carry far in the air" he knows the difference between different sea mammals calls. When he was younger and ships would come into the Bay, the mammals would flee the day before the ships arrived, because they knew they were coming. He knows this because he once worked as a Seismic Helper on land crews, I believe the company was Pan Artic.

- **Comment**: Another HTO member pointed out that in the summer, after the land seismic that all kinds of dead weasels, foxes existed after seismic.

- **Question**: What will the vessel do with ballast?

- **Answer**: It was explained that the vessel has a Ballast Water Management Plan and will adhere to all the regulations for the Arctic Waters Pollution Prevention Act. "Nothing will go over the side".

- **Question**: Does the vessel stop working during bad weather?

- **Answer**: It was explained that poor weather creates noise and affects the data quality, thus the seismic vessel doesn't work in poor weather.

- **Question**: Do you know how long whales dive? And pointed out the different mammals dive for different periods of time.
- **Answer**: It was stated that some dive for more than 30 minutes. In this, he indicated that the "Statement of Practice" should require more than 30 minutes observation before starting the air guns. It was the bowhead whale that apparently dives the longest.

- **Comment**: Another gentleman indicated, "As a hunter when it comes to Narwhals, he knows for a fact that a Narwhal can drown in five minutes. They can be wounded and stay under-water for over 10 km. And he knows that right now, the Narwhal are situated between Greenland and Baffin Bay at the bottom eating Turbot. And that Government lean towards Scientists and Inuit have there own knowledge. For example, Resolution Bay, the Walrus doesn't migrate there anymore. A ship struck west of there and now the sea mammals in all the Fiords disappeared. It's the waters between Greenland and here (Pond Inlet) mammals that we depend on.

- He thanks us for consulting in this community. They would like to talk about compensation for the disturbance to their wildlife. With this testing you are doing, wildlife will be affected. What if there are none left? Will compensation be available to us?

- **Comment**: If you are here for five years, will we be compensated if everything leaves?

- **Comment**: Rebecca Takawgak explained that they feel that if a lot of the animals are disturbed they will not feel like eating them. She called it bad (contaminated meat In general discussion, it was basically that they didn't feel they could eat the mammals after exposed to seismic. She also explained that tagged Caribou left them all dead. So people stopped eating them.

- **Comment**: Another HTO member, also present in the HTO meeting held back in February said, I don't have much to say, Pond Inlet is opposed to seismic testing. Yes we understand that you do this for a living. We depend on the wildlife. If the government approves this project we would like to see you more often to negotiate agreement and all can be happy. Then you can drill all you want once the mammals are gone.

- **Comment**: It was also stated that the government in the 60s upon exercising severity said they would have rent $2.00 and but instead look at $1000 and $2000 dollar houses. It was stated that White People come up and get what they want. If one person talks loud enough everybody

listens, and people follow what they want. I believe seismic testing harms the animals and do not want it here.

- Another gentleman asked, what was 10km in miles? This was explained.

- **Comment**: It was also mentioned that in the past, seal skins were worth a lot of money and they were able to make a good living. He said that Europeans destroyed the market. The conversation ended here, not certain what was meant by this comment.

- He mentioned that farmers receive relief for disasters, and wanted to know if their livelihood is sacrificed what relief will be there for them? He said that more needs to be known about birds and mammals, more should be known by talking to Inuit and visiting. All Canadians expect to be treated alike.

- **Question**: A woman asked about the air guns and what it looked like under water? She compared this to an explosion of propane and thought it would cause serious damage. Then she indicated that she doesn't need to spend her time worrying about marine mammals.
- **Answer**: By use of a diagram, it was explained that this is a bubble of air that collapses or bursts to release sound (makes the sound) and then it was pointed out that the air rises to the surface and was shown in a picture.

- **Question**: Who gets the results of the study? (Data)
- **Answer**: It was explained that the data will belong to TGS Nopec/PGS and copy to the NEB. And that it becomes available from NEB after a number of years for research.

- **Question**: Who owned the vessel?
- **Answer**: It was explained that PGS has the vessel on contract.

- **Comment**: Project Manager asked if it would be an option that they choose a representative from the community to keep informed of the project, with possible travel into Iqaluit to meet with all communities' representatives at the same time.

2.1.2 Conclusions

Overall, it is felt that seismic testing will harm the mammals and make them move away, change migration paths, or be contaminated in some way; which would have a significant impact on the Inuit way of life, as they rely on subsistence use of marine mammals.

They seem to be looking for some assurance that if something happens to their food chain that they would be compensated. They mention relief given to farmers and ask why they are not treated the same?

Essentially they are saying their traditional way of life is at risk.

2.2 CLYDE RIVER

Meeting	Clyde River
Location	Community Hall
Attendance	30 +
Hosts	Darlene Davis – RPS Energy Dave Hedgeland-Environmental Manager PGS
Time:	7:00pm-12:00am

The meeting was scheduled to begin at 7:00pm; however, there was a half hour delay due to the translator's flight not arriving. In the meantime, RPS was able to locate an additional translator and begin the meeting at 7:30pm.

The meeting began with a 30 minute presentation by Darlene Davis to explain the project. "The Statement of Canadian Practice" was passed out in printed form in both English and Inuktitut, after which a brief 5 minute break was taken and a questions and answer period scheduled upon return.

Comments, questions, and answers went back and forth for more than four hours at which, it was stated that we could take 5 more questions and adjourned the meeting.

The message in Clyde River is that they do not approve of seismic activity in Baffin Bay as they have nothing to gain from it and fear they will lose their livelihood as it hurts mammals; without compensation they don't know how they would survive.

Comment: They live off the land and feel that this is the only way they can be healthy. It was stated that they fear the food chain is being sacrificed and that they will then starve to death. That when they eat store bought food they become ill.

They feel that the "White Man" continues to make promises they do not keep. Especially they feel that the government treats them as a second class citizen. They state that they are Canadians, too, and that they are tired of the white man tracking through their community and not hearing what they have to say and not caring what they know about there knowledge of the land and how they survive.

They feel they are very knowledgeable and that the government doesn't want to hear what they have to say and give them compensation.

They have bitter feelings towards seismic because of the past. In the 1970's, they believe seismic is blasting, bombing, explosions. An effort is made to explain that this is not the case, but there minds are set on what they believe they know is true.

They believe that seismic hurts the mammals, kills the mammals, makes them deaf. They believe they know this for "a fact". They believe that seismic kills the fish that the mammals need to eat. They say that they have caught seals that are deaf, and they know for a fact this has been created from "seismic bombing."

The energy source was explained by PGS Environmental Manager. He explained how the airgun worked. He showed them a picture of source array and how it was made up.

They were shown a photo of the working vessel in the water and the bubbles on the surface. And an explanation to how the airguns worked.

It was explained the mitigation measures that are offered through out the industry for Geophysical surveys. “Canadian Statement of Practice”. They were given this handout in English and Inuiktitut.

They were told that PGS is willing to take observers from the communities. Another follow up meeting was held on Tuesday, May 24th with Nunavut Research Institute to follow up on possible candidates for positions onboard the vessel for marine mammal and possible onboard training.

The candidates selected from the Arctic College will be those that originate from Pond Inlet, Clyde River, Qikiqtarjuaq and Pangnirtung.

2.2.1 Comments and information shared during the discussions

- **Question**: Why do you come here if we say “no” to the work and do it anyway?
- **Answer**: To explain to you the program and ask for involvement in the project. To build a future for economy and employment.

- **Question**: In the “safety zone”, what about the fish deep below? How do you know you won’t hurt them?
- **Answer**: Environmental Manager explained what and air gun was and how it worked. We explained the statement of practice.

- **Question**: Will this trigger any volcanoes and earthquakes? (Sarah P)
- **Answer**: It was explained by PGS Environmental Manager that this was no related to this.

- **Questions**: We want to protect all animals; will the waves bother the seals that are sleeping? Will your marine mammal observers miss seeing whales when there are waves?

- **Answer**: Explained that this could honestly be possible.

- **Comment**: Stated that they wanted to stress how much we should respect the animals and tell this to the person watching marine mammals. I don’t want seismic surreys going on.

- **Question**: Why do you want to map the bottom? Why can’t you use satellite?
- **Answer**: It was explained the purpose of seismic survey.

- **Question**: Are you here to drill? What is the purpose?

- **Answer**: It was explained who the companies were and why they wanted to look at the geology. That was an initial look, 2D that typically if they seen something in the data, could lead to 3D. That the purpose was to try and sell the data in the future to oil companies. That TGS and PGS were not the oil companies.

- **Comment**: Bring better translator and better equipment.

- **Answer**: It was explained that our original translator with the equipment was late arriving due to a delay in his plane. We had a lady from their community translate without the ear pieces for people with trouble hearing. Eric Joamie who arrived an hour late, at this point handed out the ear pieces as requested. Eric Joamie was recommended by the Hamlet and advised that he does all the translations for government meetings.

- **Comment**: Write down our concerns they are important.
- **Answer**: They were advised that all their concerns were being written down in order to put into the report. That the purpose of the visit was to listen to them and try to address concerns.

- **Comment:** You can say that you are not here to drill, but this is what it leads to.
- **Answer**: This was not denied. RPS mentioned that they were aware, that INAC had come to speak with them about the possibility of opening up lease blocks.

- **Question**: How does the array go off?
- **Answer**: Environmental Manager gave another description and photo of how the air guns work and what you see in the water, etc. Environmental Manager re-explained the safety zone monitoring, as there was some confusion the streamer length versus the array.

- **Comment**: They mentioned that there is always fishing vessels on Baffin Bay all winter, don't want you in the way of fishing vessel, fishing vessels work non-stop.
- **Answer**: It was explained that the seismic vessel adheres to fishing vessels, that a Fisheries Liaison Office would be onboard for communications throughout the entire survey.

- **Comment**: I don't support what you do at all. Your maps could end up in the hands of the oil companies.

- **Comment**: If you find anything will you be back?
- **Answer**: It was explained again the purpose of the seismic project.

- **Question**: Does the sound spread out?
- **Answer**: Environmental Manager for PGS explained how sound attenuates.

- **Question**: Would fish in the safety zone be harmed?
- **Answer**: It was explained by Environmental Manager that fish do a wiggle and carry on with what they were doing. It was agreed by Environmental Manager, that yes sound travels.

- **Question**: Will Marine Mammal Observers come from the communities? We will watch for that. We will keep the media informed.
- **Answer**: It was explained again that PGS had offered through the HTO meeting in February that anyone interested in positions could contact RPS, and contact information was provided.

- **Comment**: One gentleman explained that when he was living at the Outpost he caught seals that were deaf.

- **Question**: Would it be the same equipment as last time?

- **Comment**: The same thing would happen as last time?
- **Answer**: It was explained by the Environmental Manager that this was different that in 1970's, air guns were not dynamite.

- **Question**: How long does it take the sound to come up?
- **Answer**: It was explained that this was based on water depth and geology. And an area explained and the answer given 10 seconds.

- **Question**: How long would it take to process the data?
- **Answer**: It was explained that after it was collected it was all put in a computer, produces pictures, and that this whole process could take 3 months, 6 months to a year.

- **Comment**: They said that CBC News talked about a Survey Company is working for an oil company is this you?
- **Answer**: We advised this was not PGS.

- **Comment**: Another gentleman explained that he lives in the Arctic, in this very harsh environment along with others who are not present today. That they have been deceived and tricked and I learned to watch for that, that they need to be careful. He explained that he is an expert in the land, the ice and the sea, and that he knows all about this. That all his knowledge and hunters should be listened to. They can have their own government and surveys.

- **Comment**: They are very proud to be from the Arctic and are Canadian Citizens.

- **Comment**: It was stated that they do not agree that you can just come up here and do this in their land.

- **Comment**: It was stated that the government thinks they can do what they want. They do not think it is right that people come there and take what they want form the land.

- **Comment**: It was stated that they were glad we were here, asking to come and give this information.

- **Comment**: They told us we were the "little guys" and that's why they send you here.

- **Comment**: They would start their own Environmental Assessment to look after the animals.

- **Comment**: It was stated that the current leads to the area. Oil spillage into the water and the current would come this way.

- **Question**: Who looks after this jurisdiction?
- **Answer**: It was explained who the National Energy Board was and this was their jurisdiction.

- **Comment**: They stated that the NEB should come and speak with them; that they would like to invite NEB here.

- **Comment**: They stated they are from the Arctic and any kind of decisions made really affect them. They said that people who don't live their think that the polar bears are getting skinny. It is their natural habitat and when it is quiet (his father told him) it's better. White man seem concerned about the polar bear, they are wrong.

- **Comment**: They are considered as just a statistic, they don't matter to the white man.

- **Comment**: Polar Bears are supposed to live peacefully; they run and build adrenalin into their bodies. Polar Bear never forgets how healthy they are. It is not healthy for them to be scared.

- **Comment**: Don't blame everything on global warming; polar bears are very adaptable creatures.

- **Comment**: White man say it is good to work in the Arctic, make money to buy a house.

- **Comment**: Inuit are tired of being used. You are the ones profiting financially, not us.

- **Question**: Why do you want to do the study, you may not see anything?
- **Answer**: As previously explained, it was re-explained the purpose of the seismic survey. To look at the geology.

- **Comment**: Not all Inuit are computer literate. We have no idea how to voice our concerns.
- **Answer**: It was explained that QIA is to represent their community. QIA representative being present was asked to tell them who they were. When he explained that they can voice concerns through the community Liaison Officer; he then was asked who this person was. It was explained that RPS met with QIA in January and HTO groups in Clyde River in February and that they had come here to tell them more about the project and listen to there concerns. And that the minutes from this meeting would be sent to the NEB.

- It was explained that the EA was open for comment until June 2/11.

- **Comment**: Another gentleman (Peter) thanks us for the opportunity to speak. He stated that they are all concerned about the mammals. That he has spent much time documenting why they live here, and their food sources in the Arctic. He said, "that he had come up with the theory the food is perfect for us, in the winter and summer". He said that, "he had figured out when you eat store bought food, that is not their diet". "Store bought food makes us sick".

- **Comment:** He stated that "When small animals are affected, it will affect the food chain". He also stated, "he had researched noises underwater". He had with him a tape-recording of a ship offshore and wanted to play the sound. He thought without this distraction (noise from the ship) he could hear the mammals. He played the tape of underwater noise from the vessel. And stated, "after doing research, noise travels in the water and that when you do your bombing there will be animals in the water that have no hearing".

- He stated, "I do not support the survey. This survey is worthless, it will affect the animals". He stated, "Sound will affect them and scare them away permanently". He stated, "You need to go through court of Justice to get approval from the people".

- **Comment**: Another gentleman stated, "Animals communicate even though very far distance with sound wave", I have also comment, "you at least come here to consult with community, last year you didn't bother to consult, the courts got involved".
- **Answer**: It was explained that TGS and PGS did not work there last year; that was ECASE, Lancaster Sound issue. It was explained in the

presentation that this program was 180km from the mouth of Lancaster Sound. That was not our project.

- **Comment**: It was stated, “if you are going to do the survey, I believe it would only be right that we benefit financially”.

- **Comment**: It was stated, “You need to look into working much closely with us. The criteria in which the National Government has put together in dealing with the people, they had no knowledge to put things in place. They sometimes don’t have enough knowledge, they have no idea what it is like to be here”.

- **Comment**: If anything is going to happen in our community and land more Inuit need to be hired. He stated “Inuit have a responsibility to provide for their families along with traditional meat”.

- **Comment**: He also stated “Inuit need more jobs for their young people”.

- **Comment**: He said “The Inuit that live here are important too and we have rights”.

- **Comment**: “I have lived here all my life, I was raised in Pond Inlet and moved to Clyde River. We have always hunted, when we go on ice bout a seal hole, someone with a ski doo goes around in a circle, noise makes seals skinny. Loud noises will make them skinnier and there will be no good seals to eat”.

- **Comment**: I know that when we shoot at a seal and miss they can lose their hearing. This will happen with this project”.

- **Comment**: “When Whiteman are determined to do what they want, were treated like the other side of the road, I feel this way when I am not being respected”.

- **Comment**: “This land is a gift to us from God, we never use to have jobs only hunt for survival”.

- **Comment**: “Money is more important to people, who come here to work, we still need to survive and eat from the land”.

- **Comment**: “When I heard about the project I had concerns too”. “People are out there doing their own thing and we have no idea what they are doing”. “Submarines sometimes, we have no idea why they are here and what they are doing”.

- **Comment**: “Research in Baffin, reminded me that there will be famine in the future, maybe it was the start and we will starve without money you can shop at the store”.

- **Question**: Would you train people for additional jobs onboard the vessel?
- **Answer**: PGS will be hiring marine mammal observers from the communities, and this request will be taken back to PGS for consideration of other roles onboard the vessel.

- **Comment**: “Inuit very capable of learning new things, we are just as capable people”. They then used the interpreter as an example of how smart Inuit are.

- **Comment**: “I am in the environment and I learned everything”.

- **Comment**: “You go out on the land and start fire without matches or a lighter. Inuit can do this”.

- **Comment**: “Because we live here we are experts of the environment here”.

- **Comment**: “You have no idea how to survive, you might have a PhD we would save you in an emergency”.

- **Comment**: “As Inuit, we are not recognized as experts, we do have education and deserve to be paid like experts”.

- **Comment**: “We are the experts in this environment”.

- **Comment**: (Elected Board of Director of the HTO) We will be expected to approve what they wanted? We didn’t want to approve right away. We want another chance to talk.

- **Question**: Is this why you are here again today?
- **Answer**: Yes, we are here to share information about the project an answer questions and concerns; you asked us in the HTO meeting to have a public meeting to share information with the people in the community.

- **Comment**: Because we are elected by the people, tonight we hear good comments. It was very worth it to have this meeting.

- **Comment**: Because we represent our electors, we work for the people in the communities, and they need to be involved in the decision-making. As

a board of Director of HTO, I realize this group does not want seismic offshore Baffin Bay and I agree.

- **Question**: Can you tell me the name of the two companies?
- **Answer**: Petroleum GeoServices and TGS Nopec. RPS Energy is the Canadian Lead Consultancy for the project.

- **Question**: Are you just mapping the seafloor?
- **Answer**: They want to look at the geology.

- **Question**: Does the sound go all the way down to surface?
- **Comment**: We already heard earlier sound waves goes two miles out.
- **Answer**: PGS Environmental Manager (Dave Hedgeland) explained it was like taking a picture and how the energy source worked.

- **Question**: Are the companies who hired you an oil company?
- **Answer**: It was explained, as was in the presentation the role of PGS and TGS as companies, and that they are not oil companies.

- **Comment**: Coming into a community and telling people this is what we are going to do. They want courtesy for knowing about their environment.
- **Answer**: We are here to tell you about a potential seismic project offshore Baffin Bay and try to answer your questions and concerns and as we shared with HTO groups when they asked us to conduct public meeting, to allow you to share input on the project.

- **Comment**: (David, Senior Hunter) Every time a party comes in and has a meeting they have already decided what they want to do. Be leaving tomorrow and be leaving again.

- **Comment**: I think it is important to get together and discuss further. Too short a time to relay there discussions in the community. As a community going to process of informing and stakeholders in the community voicing our concerns to the federal government regarding this issue.

- **Comment**: The impact, mechanism to be able to benefit the community. Because of the impact on the people.

- **Comment**: There are a lot of avenues to resolve some of the issues. Court is the last resort. There will be an amount of impact on the people and the environment that live here and depend on our environment.
- **Answer**: (Dave Hedgeland) We would like to come back here and continue to be in discussions and listen to your concerns. We have heard today your knowledge and we value your knowledge that kind of information is highly valuable.

- **Comment**: You will benefit from this knowledge.

- **Comment**: How can this community going to benefit right away.

- **Comment**: The people behind the project should be coming to negotiate with the people from Clyde River. Were going to have to do this for this project to go ahead.

- **Comment**: We are a community we are no longer going to accept people deciding for us.

- **Comment**: Outsiders need to understand we have rights as well.

- **Comment**: I am sure you will go back to your partners to explain what you have gathered here tonight.

- **Comment**: To back to the companies and tell them to come back to this community to negotiate with us for this project to go forward.

- **Comment**: A lot of local people have the need and continue to eat traditional food we depended on for generations.

- **Comment**: We need the healthy nutritious food. We cannot support this if it will have an impact on the mammals.

- **Comment**: As long as we benefit from it, we need money to buy food, conditions if these things happen. There should be a contract, and they should benefit somehow.

- **Comment**: We need compensation for impact.

- **Comment**: We need an impact agreement between the parties.

- **Comment**: We have been abused long enough by white people.

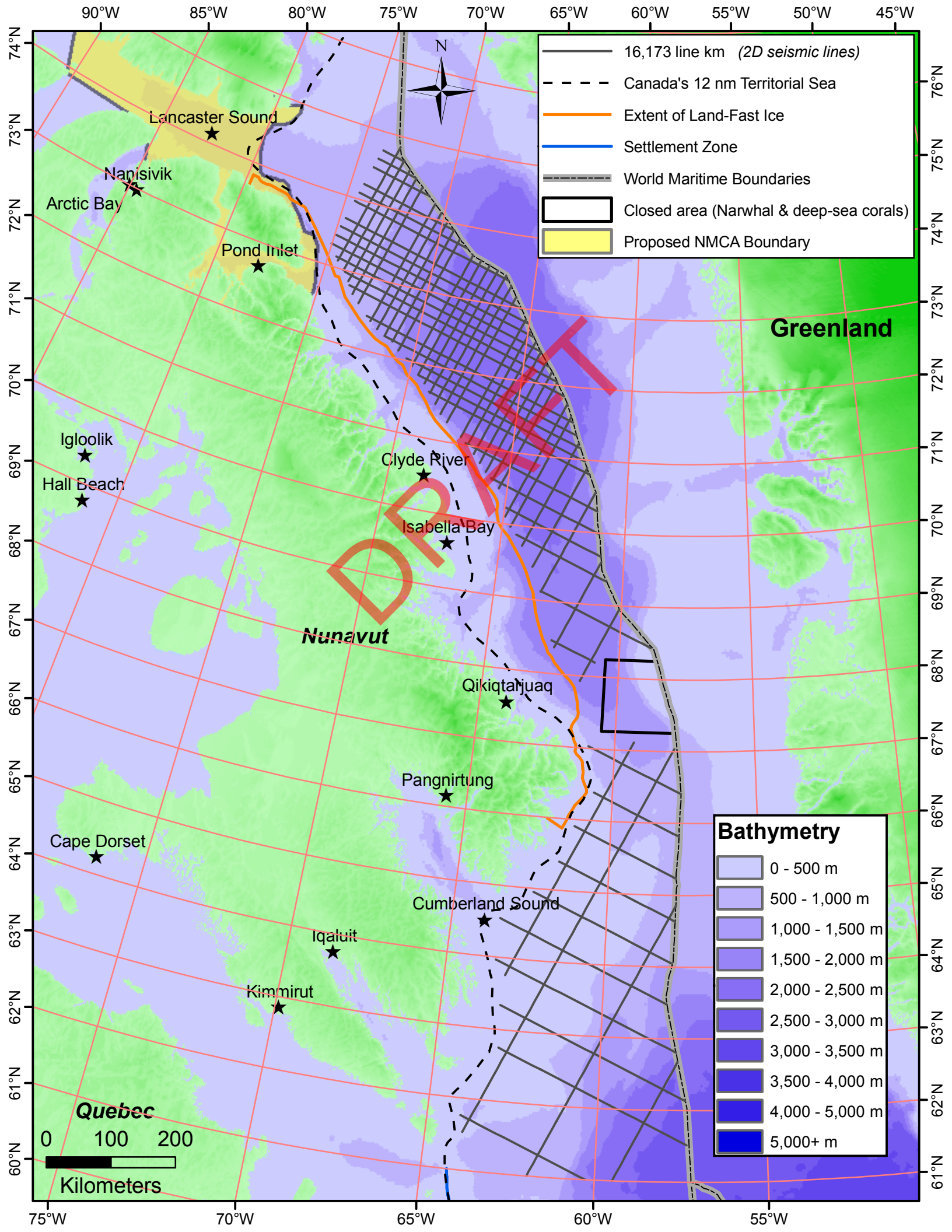
- **Comment**: White people bearing children in the communities and leave them behind.

- **Comment**: Raping in the communities is not acceptable.

- **Question**: Is the seismic close to the shore?
- **Answer**: Closest line in 40 km from shore.

- **Comment**: If it is fairly close to the community further consultation with Pond Inlet and HTO and negotiations with the company. Determine the impact in the communities.

Appendix 7. Extent of Proposed 2D Program


16,173 line km (2D seismic lines)
Canada's 12 nm Territorial Sea
Extent of Land-Fast Ice
Settlement Zone
World Maritime Boundaries
Closed area (Narwhal & deep-sea corals)
Proposed NMCA Boundary
Bathymetry
0 - 500 m
500 - 1,000 m
1,000 - 1,500 m
1,500 - 2,000 m
2,000 - 2,500 m
2,500 - 3,000 m
3,000 - 3,500 m
3,500 - 4,000 m
4,000 - 5,000 m
5,000+ m
Lancaster Sound
Nanisivik
Arctic Bay
Pond Inlet
Igloolik
Hall Beach
Clyde River
Isabella Bay
Qikiqtarjuaq
Pangnirtung
Cape Dorset
Cumberland Sound
Iqaluit
Kimmirut
Nunavut
Quebec
Greenland
DRAFT
0 100 200
Kilometers
N
90°W
85°W
80°W
75°W
70°W
65°W
60°W
55°W
50°W
45°W
74°N
73°N
72°N
71°N
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69°N
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