Purpose

The Summary of Oil Spill Prevention and Response Plan for the onshore pipeline transport system (PTS) is intended for public information, in accordance with the Health, Safety, Environmental & Social Action Plan (HSESAP).

The objective of the Oil Spill Prevention and Response Plan for the onshore pipeline system is to arrange and prepare the effective Emergency Response that mitigates the potential consequences of an incident for people (local community and Company personnel), environment, Company assets and reputation, and enables normal operations to be resumed efficiently.

Please refer to the document “Summary of the Corporate ER Standard in relation to oil spill preparedness and response” for an overview of this topic and links to Summary OSR (Oil Spill Response) plans of other Sakhalin Energy facilities.
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1. **Scope of the Plan and Description of the Facility**

The OSR Plan is covering the entire territory along the pipelines – from the shoreline to the facilities of Prigorodnoye Production Complex. The dimensions of this zone (distance from pipelines) are determined by the borderline corresponding to the maximum possible area of oil pollution in the worst-case spill scenarios, see Fig. 1.

The pipelines route runs from the north to the south of Sakhalin Island crossing the areas with different nature and climates, geology and hydro-geological conditions. The route crosses the mountain area with high mud slide, slide, avalanche hazards (Makarov District), bogs, and wetland, and more than 1,100 water courses. The total length of the route is about 784 km. The design provides for pipeline installation at a minimum depth of 0.8m for pipes with a diameter of up to 1,000mm and installed at a depth of at least 1.0m for larger pipes.

The onshore pipelines are used for transporting oil and gas from Piltun-Astokhskoye (PA) field, as well as gas and condensate from Lunskoye field to Onshore Production Facilities (OPF) located in the south of Sakhalin Island: the Liquefied Natural Gas (LNG) plant and the Oil export terminal (OET).

The onshore pipelines include trunk and supply oil and gas pipelines. The line part of the route comprises the pipeline, lock valves, pig launcher/receiver, Booster Station 2 (BS-2), crossings, branches towards, electrochemical anti-corrosion protection for the pipelines; telemechanics and real-time controls of the pipeline system; power supply devices and valve and cathodic protection remote controls; fiber optic communication cable; erosion, mud slide, slide, and avalanche protection for the pipelines; access roads towards the lock valves and cathode protection stations, helicopter decks for pipeline maintenance.

Pig launchers/receivers are used for removal of internal mineral deposits from pipelines (mud, paraffines, etc.) and preventing any delays of pumped liquid, as well as for in-line inspection.

All valves have electric and hydraulic drive and are equipped with telemetry systems allowing a remote opening/closing of shut-off valves from line control centers (dispatcher centers), record and transfer of data relating to valve status, pressure and temperature in certain point of pipeline. The valves can also be activated at site, i.e. manually. All valves of PTS are buried.

BS-2 is an interim transfer station at OPF—LNG/OET and is used to maintain pressure at the required level within the whole trunk part of the onshore pipeline. BS-2 is located at a distance of 800 m to the north of Gastello, Poronaysk district (UTM 641278 E, 544 2658N). The maximum oil capacity of BS-2 is 1,566 m$^3$/hour.
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Fig. 1. Facilities within the scope of Oil Spill Prevention and Response plan for PTS and OSR plans for other facilities of Sakhalin Energy

Table 1 shows physical and chemical characteristics of crude oil and condensate from offshore fields, and Table 2 is demonstrating the same characteristics of oil products.

Table 1. Characteristics of crude oil and gas condensate from off-shore fields
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#### Table 2. Characteristics of oil products used during operation of the onshore pipelines

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Unit</th>
<th>Diesel fuel</th>
<th>Lubricants</th>
<th>Jet fuel</th>
</tr>
</thead>
<tbody>
<tr>
<td>Density</td>
<td>g/cm³</td>
<td>0.830</td>
<td>0.895</td>
<td>0.780</td>
</tr>
<tr>
<td></td>
<td>API</td>
<td>38.9</td>
<td>26.6</td>
<td>49.9</td>
</tr>
<tr>
<td>Dynamic viscosity 20°C</td>
<td>cSt</td>
<td>1.5—4.0 @ 20°C</td>
<td>28.8—35.2 @ 40°C</td>
<td>1.3 @ 20°C</td>
</tr>
<tr>
<td>Sulfur content</td>
<td>%</td>
<td>0.4</td>
<td>0.3</td>
<td>0.2</td>
</tr>
<tr>
<td>Pour point</td>
<td>°C</td>
<td>-55</td>
<td>-15</td>
<td>-60</td>
</tr>
<tr>
<td>Vapor flash point</td>
<td>°C</td>
<td>30</td>
<td>186</td>
<td>28</td>
</tr>
<tr>
<td>Self-ignition point</td>
<td>°C</td>
<td>330</td>
<td>220</td>
<td></td>
</tr>
<tr>
<td>Estimated percentage of evaporation of spilled oil for 6 hours</td>
<td>%</td>
<td>30–40</td>
<td>0–10</td>
<td>70–100</td>
</tr>
<tr>
<td>Water content</td>
<td>%</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Maximum emulsification percentage</td>
<td>%</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>
2. Prevention of oil spills.

All line/site facilities of the Transport Pipeline System are equipped with oil and oil products spill prevention systems. For consolidated data see Table 3.

After reaching the design operational mode, tightness control of the onshore pipelines is ensured by ATMOS PIPE™ hardware/software system connected to SCADA system. The system uses the results of accounting oil consumption and pressure in pipelines to detect the fact and the point of leakage. ATMOS PIPE hardware/software system can detect leakage of a volume less than 1% of the total cumulative flow.

Table 3. Procedures for preventing leakage at line/site production facilities of the Transport Pipeline System

<table>
<thead>
<tr>
<th>1.0</th>
<th>Ensuring general integrity and construction quality of pipeline</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1</td>
<td>Full (100%) quality control of welding joints and assemblies during construction</td>
</tr>
<tr>
<td>1.2</td>
<td>Coating pipeline with three layers of a polymer to prevent formation and development of corrosion</td>
</tr>
<tr>
<td>1.3</td>
<td>Installation of valve systems and pig launch/trap stations</td>
</tr>
<tr>
<td>1.4</td>
<td>Hydrotesting of the whole pipeline system before commissioning</td>
</tr>
<tr>
<td>1.5</td>
<td>Use of electrochemical protection facilities</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2.0</th>
<th>Protection against mud flows and landslides</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1</td>
<td>Burying of pipelines to a depth of 0.5 m below the maximum scouring line, with a 5% cumulative probability of mud flow</td>
</tr>
<tr>
<td>2.2</td>
<td>Leveling and stabilizing of slopes, construction of water retaining structures and bearing walls</td>
</tr>
<tr>
<td>2.3</td>
<td>Reinstantatement of natural relief to ensure stability of ground on slopes</td>
</tr>
<tr>
<td>2.4</td>
<td>Additional burying of pipelines by 2 meters at mud flow hazard areas coinciding in size and location with landslide areas</td>
</tr>
<tr>
<td>2.5</td>
<td>Construction of bearing walls at mud flow/landslide hazardous sections</td>
</tr>
<tr>
<td>2.6</td>
<td>Stabilizing landslides at the highest risk areas.</td>
</tr>
<tr>
<td>2.7</td>
<td>Control and adjustment of surface drainage to prevent or significantly reduce damping of soil with rain/thaw water.</td>
</tr>
<tr>
<td>2.8</td>
<td>At the landslide area additional drainage channels are made, which help to discharge water from slopes</td>
</tr>
<tr>
<td>2.9</td>
<td>Installation of bearing walls and leveling of slopes to decrease the landslide probability</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>3.0</th>
<th>Avalanche protection</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.1</td>
<td>Construction of avalanche breakers, curtain earth banks and snow discharge pits</td>
</tr>
<tr>
<td>3.2</td>
<td>Terracing of slopes with a height exceeding 10 m within the pipeline route area</td>
</tr>
<tr>
<td>3.3</td>
<td>Strengthening (reinforcement) of steep slopes</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>4.0</th>
<th>Erosion control</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.1</td>
<td>At the most hazardous bank erosion areas line facilities are protected from such processes by existing transport infrastructure facilities, such as motor road/railroad sections</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>5.0</th>
<th>Earthquake protection</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.1</td>
<td>Trenches of a special geometry are designed were constructed, special materials are selected for filling, as well as special seismic fault crossing angles</td>
</tr>
<tr>
<td>5.2</td>
<td>Seismic sensors are installed at some river crossings to monitor vibration of soil and pipelines</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>6.0</th>
<th>Operation of the transport pipeline system</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.1</td>
<td>Use of automatic ATMOS system to control and detect leakage after reaching the design condition of the pipeline system</td>
</tr>
<tr>
<td>6.2</td>
<td>The pipeline system is equipped with pig launch/trap stations for a periodic cleaning of the internal cavity and carrying out in-line inspection to make sure that pipeline is intact</td>
</tr>
<tr>
<td>6.3</td>
<td>Use of a multilevel system of safe discharge and emergency shut-down</td>
</tr>
</tbody>
</table>
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<table>
<thead>
<tr>
<th>7.0 Protection against unauthorized interference</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.1 Burying of all pipelines</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>8.0 Protection against seismic risks</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.1 Use of heavy-wall pipes made from high quality steel subject to 100% material quality control</td>
</tr>
</tbody>
</table>

In order to ensure safe operation of the pipeline system, the oil pipeline uses 99 BVS (Block Valve Station), and 4 BVS (2 line valves and 2 safety valves) are used at multiphase pipelines. The valves are placed at a distance of not more than 30 km, and at rugged relief sections (major rivers, faults) distance between the valves is less that 30km. BVS are installed to isolate pipeline sections in case of a failure or damage of pipeline. All valves are buried. Line valves are controlled remotely from the central control station of OPF or reserve station at BS-2.

Safety systems for pipeline system facilities and process equipment are developed with an allowance for operation in cold climate. They include:

- Use of automatic mechanical devices and systems;
- Automatic recording of abnormal operating conditions of the onshore pipelines or equipment status;
- Automatic response to abnormal conditions by emergency shutdown and/or isolation, and also where applicable - pressure relief in pipelines and other production units;
- Use of additional manual control devices for emergency shutdown and/or isolation, pressure relief;
- Monitoring of potential hazards and elimination of potential sources of ignition;
- Provision of sound and visual means for the onshore pipeline operators and staff to receive information on the emergency shutdown system; and
- Wherever appropriate, the safety equipment is developed as "fault-secure", with the corresponding systems backup to protect against failure of separate components (for example, all communication lines between the control elements of the integral control and safety system are laid on different routes and have full double backup).

Access of unauthorized persons to line/site production facilities of Sakhalin Energy's PTS is prohibited. Non-trained persons or those not briefed in safety requirements shall not be permitted access to the pipeline system facilities. The pipeline security service and security guards (line/site facilities of the pipeline system) are responsible for control of access to PTS facilities and for emergency response within these facilities. The pipeline system security coordinator will be promptly notified of all emergency situations connected with operations or safety of PTS facilities.

All alarms received from BVS are supplied to OPF security station, BS-2 and OPF control stations for verification and taking relevant actions. The alarm received by a station is transmitted to other stations as a backup in case of a failure in the annunciation system.

Under official agreements with the internal affairs authorities, a police team should be sent, on Company's request, to the section, from which the alarm is received, to clarify the situation, and operational units, together with the security units, shall initiate planned response actions at the emergency section. The response shall be arranged by the nearby operations facility of the pipeline system, PMD, LNG/OET or the Yuzhno-Sakhalinsk office, depending on the location from which the alarm is received. The response is coordinated through BS-2 and/or OPF control stations, as well as PTS Safety Coordinator or the central security station of pipeline system facilities.

3. Forecasting volumes and areas of oil spills and planning used resources.

The maximum pollution area was determined in accordance with the adopted algorithm:

- For the whole route of onshore pipeline system, risks of spill have been evaluated;
- The most dangerous, with regard to scale and consequences, sources of spill have been identified in accordance with requirements of resolutions of the RF Government Nos. 613 and 240, subject to the...
results of quantitative risk assessment (possible sources of spills are demonstrated in Fig. 2 and listed below);

- The behaviour of oil on shore, on river banks and in water courses for the worst-case conditions was simulated; and
- Based on the simulation, the maximum pollution area was determined for the worst-case conditions.

When determining territories, rivers and river banks, sections of coastline covered by this OSR Plan, data of the computer modeling of the worst-case spill from the onshore pipeline system facilities performed at the request of Sakhalin Energy have been used.

For OSR planning purpose, including modeling of spill movement routes, the maximum spill volumes at the line part of PTS were used for two situations of oil/oil products spill from pipelines determined under Resolution of the RF Government No. 613 dated August 21, 2000:

- in case of a rupture — 25% of cumulative flow within 6 hours and oil volume in pipeline between the valves of the damaged section; and
- in case of a puncture — 2% of the maximum cumulative flow within 14 days.

The Company has also performed a quantitative risk assessment (QRA) for oil/oil products spill during operation of three segments of the line part of the onshore pipeline system.

The maximum spill at the process facilities involved in oil pumping is determined for the worst-case scenarios. For oil product storage facilities, maximum spill volumes are determined under Resolution of the RF Government No. 613 dated August 21, 2000:

- spill from a stationary oil products storage tank — 100% volume of the maximum capacity of a tank;
- spill from an oil- tank truck— 100% of tank volume; and
- spills from pipeline.

The worst-case scenario for an emergency (oil) with a maximum area of pollution caused by a spill of oil is determined in this Plan as a full oil pipeline rupture, which can lead to the maximum spill of oil and oil products of 9,643 m³ (8,195 t). This scenario made in accordance with Resolution of the RF Government No. 613. In the case of a puncture the relevant quantity is 2 percent of the maximum volume of throughput flowing for a 14 day period.

Under Resolution of the RF Government No. 613 dated August 21, 2000 (amended by the Resolution of the RF Government No. 240 dated 15.04.2002), the category of this plan is determined as the federal level.

This scenario is the worst case incident in terms of spill volume, but this is not necessarily the worst case scenario in terms of response needs. The volume released is 9,643 m³ of oil-condensate blend. The location of the maximum spill volume is in a region close to the OPF where response times are relatively low. The spill location is between block valves NOB-01 and NOB-02, between 15km and 41.4km south of the OPF. The primary response is mounted from the OPF PMD (travel time estimated at approximately 1.6 hrs) with a secondary response from the PMD Yasnoye (estimated 3.5 hrs travel time) and the PMD at Nogliki (3 hrs travel time). Additional earth moving equipment from other facilities would also be mobilised for contaminated soil removal or reworking.

Retaining walls (bunds), sorbent barriers or other barriers will be constructed around the oil spill contaminated area to contain an onshore oil spill. If containment boom equipment is unavailable or unsuitable a closed bund (or trench) around the oil spill area must be constructed.
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Fig. 2. Potential sources of oil/oil products spill at the PTS facilities

3.1. Pipeline Maintenance Depots (PMD)

Small reserves of diesel fuel, according to the following volume data, are stored in pipeline maintenance depots.

Table 4. Tanks with diesel fuel at pipeline maintenance depots

<table>
<thead>
<tr>
<th>Location of PMD</th>
<th>Quantity</th>
<th>Volume</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>PMD Nogliki</td>
<td>2</td>
<td>20 m³</td>
<td>Fuel for generator</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>10 m³</td>
<td>Fuel for motor vehicles</td>
</tr>
<tr>
<td>PMD OPF</td>
<td>1</td>
<td>20 m³</td>
<td>Fuel for generator</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>20 m³</td>
<td>Fuel for motor vehicles</td>
</tr>
<tr>
<td>PMD Yasnoye</td>
<td>2</td>
<td>20 m³</td>
<td>Fuel for generator</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>10 m³</td>
<td>Fuel for motor vehicles</td>
</tr>
<tr>
<td>BS-2 (facility)</td>
<td>2</td>
<td>50 m³</td>
<td>Fuel for emergency generator</td>
</tr>
<tr>
<td>Gastello PMD (BS-2)</td>
<td>1</td>
<td>20 m³</td>
<td>Fuel for generator</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>10 m³</td>
<td>Fuel for motor vehicles</td>
</tr>
<tr>
<td>PMD Sovetskoye</td>
<td>2</td>
<td>20 m³</td>
<td>Fuel for generator</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>10 m³</td>
<td>Fuel for motor vehicles</td>
</tr>
</tbody>
</table>

The worst-case scenario can involve a spill of the full content from one tank. Nevertheless, the risk of pollution of the environment is at a minimum due to protective bunding around all tanks.
4. Response Strategy and Protection Priorities

In accordance with the requirements, the primary objective in oil spill control is "containment of spills at the accident site and, wherever possible, urgent collection of oil" with the purpose of minimizing the harmful impact of oil on health, working conditions of people, and environment. In this connection, Sakhalin Energy is maintaining equipment, management system, procedures and preparedness of staff at a level that will make it possible to effectively respond to oil spills at any location and at any time.

In oil spill response (OSR), the following priorities are emphasized:

- People: ensuring safety of employees, response staff and population;
- Environment: protection of environmentally vulnerable zones and species of wildlife (marine mammals, birds, mollusks, and protected coastal ecosystems);
- Assets: protection of property and socioeconomic resources (e.g. fisheries) and Sakhalin Energy’s facilities;
- Reputation: Protection of Sakhalin Energy’s reputation through:
  - prompt response with engagement of all necessary resources and trained staff;
  - regular checks of response organization and procedures, emergency communication and alarm systems;
  - provision of information to people (company staff, nearest relatives, representatives of state administration bodies, general public and mass media);
  - wish to help and honest behavior;
  - rehabilitation of the environment to the original condition;
  - fair treatment of grievances and compensations; and
  - lessons learned.

Analysis of resources and manpower that are necessary for taking effective actions for oil and oil product spill response for various scenarios of emergency development was made on the basis of preferable response strategies.

The oil spill emergency response strategy in the water area provides:
1. adequate actions to ensure the safety of the Sakhalin Energy staff, spills source control;
2. containment and collection of spilled hydrocarbons at the source of spill to prevent oil pollution impact on the coast, bays and stream flow estuaries;
3. protection of special importance zones, including entries to bays and lagoons, spawning stream estuaries;
4. cleaning of the coast line (if required); and
5. restoration and rehabilitation of polluted areas.

4.1. Manufacturing restrictions and limitations for safety reasons

There are environment-dependent limitations to all OSR equipment and strategies. Response strategies in case of offshore spills are selected primarily based on the condition of the sea surface. These strategies and methods are split as follows.

Offshore spill response (in water):
- rovers and streams (water courses);
- lakes and own wetlands; and
- coastal sea water and lagoons.

Response to onshore spills:
- rover banks;
- soil; and
- sea shore – shoreline.

Table 5 contains the list and general recommendations for selection of oil spill response methods for rivers and water courses in different conditions.
Table 5 Oil spill response methods in rivers and streams (water courses)

<table>
<thead>
<tr>
<th>Response</th>
<th>Ice-free conditions (free water)</th>
<th>Ice conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Fast water</td>
<td>Slow water</td>
</tr>
<tr>
<td>Containment and collection with booms</td>
<td>D</td>
<td>R</td>
</tr>
<tr>
<td>Use of blocking or guiding (diverting) booms</td>
<td>R</td>
<td>R</td>
</tr>
<tr>
<td>Use of absorbent materials</td>
<td>D</td>
<td></td>
</tr>
<tr>
<td>Use of absorbing booms</td>
<td>D</td>
<td>R</td>
</tr>
<tr>
<td>Temporary spillways and dams</td>
<td>R</td>
<td></td>
</tr>
<tr>
<td>Collection by skimmers</td>
<td>D</td>
<td>R</td>
</tr>
<tr>
<td>Use of chemicals</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Incineration</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cutting ice holes/slots</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*R – recommended

*D – depends of circumstances. Can be used at small sites or subject to compliance with certain conditions (see below).

- Not recommended.

4.2. Containment and collection with booms

In order to catch, accumulate and keep oil travelling downstream, booms can be used to be deployed from the river bank. Oil which has been accumulated and kept in the upper part of the boom is collected and transferred to temporary storage tanks.

Key limitations to the use of the method are:

- current speed: booms can be efficiently used only when actual speed of perpendicular current/stream (i.e. current square to the booms) does not exceed 0.38 m/sec (0.75 knots), since higher speeds make oil penetrate under booms; and

- vertical mixing energy of water: high turbulence of a flow makes oil mix with water and penetrate under the boom.

The limitations can be eliminated by:

- installation of booms at an angle;
- setting several cascade or intersection boom barriers across the river/water course; and
- installation of booms with lower current.

4.3. Response categories in case of an emergency oil spill

The company uses a tier-based response system as follows:

- Tier 1 – a local facility, covers the most probable situations leading to comparably small-scale emergencies at the facility, with their effect being insignificant - response is arranged by the trained staff of Sakhalin Energy (asset ERT) and contractors;
- Tier 2 – covering medium-scale emergencies, with considerable possible effects - to respond to spills of such scale, including but not limited to third party regional (oblast) resources and facilities; and
- Tier 3 – hypothetical worst-case emergencies, major emergencies, of a scale exceeding Tier 2 emergencies. Resources and facilities of federal or international OSR organizations are involved in response.

If Sakhalin Energy determines the higher tier of response (i.e. two or three) or the Head Department of the Emercom (GU MChS) does not confirm tier one determined by the Company, the Company's crisis situations manager shall:

- after consultation with emergency coordinator (EC), invite representatives of GU MChS for participation in the activities of the crisis response group; and
- discuss with a representative of GU MChS a proposal as to formation of the “Unified Command”.

The decision as to classification of an emergency oil spill as a response tier 2 or higher is taken by the relevant federal and regional governmental authorities based on the criteria indicated in Resolution of the
4.4. Occupational safety and safety precautions during oil/oil products spill response

Emergency operations related to oil spill response should always be conducted in accordance with Sakhalin Energy procedures on occupational safety, health and emergency response. However, in an emergency situation, a lot of additional hazards may arise, such as toxic fumes generated by spilled oil products, oil-contaminated slippery surfaces, fatigue-related factors, etc. In this connection, the personnel of emergency rescue teams must follow additional safety rules specific to the conditions of this particular emergency situation.

Participants in emergency work may face various natural hazards, including:

- Presence of ice cover;
- Adverse weather conditions (stormy wind, heavy rain or snow, low temperatures);
- Landscape features; and
- Hazards posed by interaction with the animal world.

Employees are not allowed to work on emergency oil spill response without the necessary safety training and induction training on safety issues for the particular site where they will work. For some OSR objects, workers must have valid safety certificates and undergo special training on these issues.

For safety purposes, all personnel must use personal protective equipment, both during performance of specific operations, and in the process of movement between work areas or from parking places to work locations. Certain elements of personal protective equipment are mandatory. Concrete requirements to protective equipment and outfit are listed below:

- Safety glasses should be used on all work sites;
- Hard hats are obligatory in cases when items could fall from above at workplaces, or when there is danger of hitting items located above;
- Protective overalls and equipment shall be used in order to prevent contact with oil, which may include oil-resistant boots, gloves, impervious suits, safety glasses or face masks, depending on the type of performed work; and
- Wearing oil-resistant boots, impervious suits and gloves is obligatory.

At the emergency operation locations, as well as at the points of waste disposal, sanitary treatment stations shall be arranged. The operational safety service shall control the efficiency of sanitary treatment of staff (e.g., washing hands, removal of PPE (Personal Protection Equipment) contaminated with oil).

A restricted area is recommended to be established around the source of continuous crude oil or condensate spill. The size of the restricted area depends on the results of safety assessment and consultations with MChS and Internal Affairs authorities. Arrangement of restricted areas and use of a special regime in the areas of OSR activities is only possible in coordination with local MChS and Internal Affairs authorities.

4.5. Environmental priorities

Environmental priorities are:

- natural sanctuaries;
- perspective wetlands of international value (the "shadow list" of the Ramsar Convention); and
- habitats of rare and protected species of mammals and birds introduced in the List of the International Union for Conservation of Nature (IUCN) and Red Books of the Russian Federation and Sakhalin Oblast

Particular priorities of emergency response actions are established on the basis of the following criteria:
• actions should provide maximum net environmental benefit;
• the strategies selected should be directed toward maximum possible clean-up of spilled oil with minimum possible environmental damage.
• the actions taken should be aimed, first of all, at those territories and resources that are characterised by least self-regeneration capability; and
• in the course of emergency operations, materials and staff should be utilized in the most efficient manner.

Amount of wastes generated in the course of emergency response operations should be minimized. During emergency activities relating to OSR a monitoring shall be performed including:
• Reconnaissance of the area and water courses to determine distribution and stability of oil pollution or efficiency of cleaning methods;
• Monitoring of oil aeration to establish the degree of oil decomposition to predict the stability of oil or behavior of oil residues (for handling oil containing waste);
• Monitoring of efficiency and timeliness of response; and
• Occupational safety monitoring.

The monitoring type and scope during oil spill cleanup is determined by the coordinator of emergency response operations together with the heads of the Planning Sector and Production Sector, labor safety representative and state structures.

The results of monitoring at the stage of oil spill cleanup directly affect the priorities, strategies and methods used in the course of oil spill cleanup activities.

Cleanup operations concentrate on areas with the greatest amount of the spilled oil, which allows collecting the maximum amount thereof. The strategies of protection and cleanup are directed at the most vulnerable areas or resources. The most efficient cleaning strategies allow collecting the maximum quantity of oil spilt and minimizing damage to the environment.

4.6. Resourses Exposed to Pollution – Resourses of Priority Environmental Protection

Sakhalin Energy has implemented a number of projects related to studying the environment along the pipeline route and at pipeline system. Based on the results of these studies, a detailed description of physiogeographical characteristics, flora, wetlands, river/transport network has been prepared, which is illustrated by photos. Along with this, at the initiative of Sakhalin Energy, aerial mapping was carried out along the pipeline system route and basic watercourses; a digital video record of the observations has been made. These materials were further used during the development of the geographic information system (GIS) and actions aimed at containment of oil/oil products spills at certain internal water Resourses along the route of the pipeline transport system.

The most environmentally vulnerable sections of the region are the lagoons of the north-east coast of Sakhalin. Specially protected areas have been identified in the region for protection of fauna complexes and habitats of rare and endangered bird species. The specially protected areas along the pipeline route and particularly important zone are demonstrated in Table 6.

Table 6. Basic resources exposed to oil spills

<table>
<thead>
<tr>
<th>No.</th>
<th>Name, habitat/location of Resourses</th>
<th>North-east area</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Particularly important Resourses /protected areas</td>
<td></td>
</tr>
<tr>
<td>1.1</td>
<td>Severny nature reserve</td>
<td></td>
</tr>
<tr>
<td>1.2</td>
<td>“Liarvo Island” complex - nature sanctuary</td>
<td></td>
</tr>
<tr>
<td>1.3</td>
<td>“Wrangel Island” complex - nature sanctuary</td>
<td></td>
</tr>
<tr>
<td>1.4</td>
<td>“Chayachy Island” complex - nature sanctuary</td>
<td></td>
</tr>
<tr>
<td>1.5</td>
<td>“Lunskoy bay” complex - nature sanctuary</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Sea birds:</td>
<td></td>
</tr>
<tr>
<td>2.1</td>
<td>Areas of high density population of white-winged scoter in up to 2 km wide and up to 10 m deep coastal strip.</td>
<td></td>
</tr>
</tbody>
</table>
2.2 Sea birds colonies at cliff sections of Patience (Terpeniya?) Bay and Tyuleny Island coast.

2.3 Accumulations of sea diving birds and non-diving birds during migrations, nomadic migrations and fostering in open coastal waters of the Sea of Okhotsk and bay areas.

2.4 Accumulations in bays of the colonies of Aleutian tern and common tern, which are considered to be natural monuments: Wrangel Island (Piltun Bay), Liarvo Island (Nyisky bay), Chayachy Island (Nabil Bay).

2.5 Accumulations of wading birds and swimming birds, including those recorded in the Red Book, at low wetlands and silty sand sections of island and bay coast (Ekhabi, Piltun, Chaivo, Nysky, Nabil and Lunskoy).

2.6 Nesting places of carnivorous semi-aquatic birds of prey (Steller’s sea eagle and white-tailed eagle, osprey, etc.)

3 Fish and fishery resources:

3.1 Spawning rivers (salmon).

Aniva Bay

1 Particularly important Resources /protected areas

1.1 Busse lagoon

1.2 Territory on the east coast of Sakhalin Island - water/hydrologic natural monument of regional importance; it can only be affected in the case of a major emergency (oil).

2 Sea birds:

2.1 Salmon Bay, Grina Cape and habitat of aqueous and semi-aqueous birds in this area.

2.2 Accumulations of semi-aqueous and wading birds, including those recorded in the Red Book, at coastal wetlands, lagoon/bay coast, as well as sandy sea beaches.

2.3 Places of nesting and fostering of protected birds of prey.

3 Fish and fishery resources:

3.1 Humpback salmon population in Aniva Bay having a commercial importance.

3.2 Mouths of spawning rivers flowing to Aniva Bay (the greatest among them are Mereya, Lyutoga, Taranai and Ostrovka).

4 Other objects:

4.1 Korsakov port

4.7. Environmental protection activities

Environmental monitoring and observation of environmental resources and the processes of rehabilitation of environmental resources during and after emergency (oil) response activities will be carried out by specialized enterprises and organizations having relevant certificates, licenses and accreditation in this field (such as Rosgidromet and others).

The actions to liquidate oil pollution consequences for fauna will be taken according to the following Wildlife Rehabilitation Plan:

- Actions to prevent and eliminate consequences of oil and oil products pollution affecting fauna representatives resulting from oil or oil products spills and also situations and incidents accompanying the emergency;
- Necessary means and resources to eliminate the consequences of oil contamination of fauna representatives;
- Response procedures; and
- Procedures on coordination and cooperation between the corporate and third party organizations and resources to eliminate the consequences of oil pollution of fauna representatives.

4.7.1. Waste disposal

When carrying out on-shore and off-shore activities, oil-contaminated wastes are generated. The quantity of such wastes should be minimized by organizational activities.

Each PMD is equipped with tanks for temporary storage of liquid wastes in the volume of 100 m3. Each rapid deployment pack has the facilities for temporary storage of liquid wastes. There are following tanks
are available at each PMD and Prigorodnoye for storage capacity: 3 Pillow Tanks (4 m³ each); 6 Collapsible Tanks (10 m³); 2 Container-tanks Storage (20 m³).

Also there are 32 Collapsible Tank (Fastanks; 7.5 m³) at Nogliki PMD.

Vacuum tank trucks and platform trucks "Ural" are used for waste transportation. These tank trucks also could be used as temporary storage.

On the whole, waste management in case of a spill will be carried out through the Emergency Coordination Team (ECT) Operations Sector directly heading the response and controlling operational groups (on-shore and off-shore spill response groups). At the later phases of liquidation activities, when the activities stipulate long-term storage, processing and disposal, waste management functions will be handed over to Logistics Sector.

4.8. Resources affected by pollution – economic, cultural and historical resources

For information related to socio-economic characteristics of the areas crossed by onshore route see Table 7.

Table 7. Socio-economic characteristic of the onshore pipeline area

<table>
<thead>
<tr>
<th>Resources</th>
<th>North-east area</th>
<th>Central area (Patience Bay)</th>
<th>South area (Aniva Bay)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communities</td>
<td>Low-populated area</td>
<td>Low-populated area, except Yuzhno-Sakhalinsk district</td>
<td>Average density of the population</td>
</tr>
<tr>
<td></td>
<td>Okha city (35 thousand residents)</td>
<td>Yuzhno-Sakhalinsk city (177 thousand residents)</td>
<td>Korsakov city (36.5 thousand residents)</td>
</tr>
<tr>
<td></td>
<td>Nogliki settlement (13 thousand residents)</td>
<td>Poronaysk city (21.1 thousand residents)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Katangli settlement</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Kaygan port</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>a number of small communities: Val, Piltun, Sabo, Tungor, Ekhabi</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Industry</td>
<td>Oil industry: production and transportation</td>
<td>Fishery</td>
<td>Ice-free port Korsakov</td>
</tr>
<tr>
<td></td>
<td>Oil industry: refining (Smirnykhovsky district)</td>
<td>Fisheries</td>
<td>Commercial fishery Fisheries</td>
</tr>
<tr>
<td></td>
<td>Fishery, traditional (aboriginal population) and private trade</td>
<td></td>
<td>Growing seaweed</td>
</tr>
<tr>
<td>Transport and infrastructure</td>
<td>Yuzhno-Sakhalinsk railroad Nogliki</td>
<td>Yuzhno-Sakhalinsk railroad Nogliki</td>
<td>Railroad Yuzhno-Sakhalinsk – Korsakov</td>
</tr>
<tr>
<td></td>
<td>Motor road Nogliki - Okha (unpaved)</td>
<td>Yuzhno-Sakhalinsk – Nogliki motor road</td>
<td>Asphalted highway Korsakov – Yuzhno-Sakhalinsk</td>
</tr>
<tr>
<td></td>
<td>Airport in Okha, Nogliki/helicopter landing deck</td>
<td>Yuzhno-Sakhalinsk airport</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Kaygan port</td>
<td>Poronaisk port</td>
<td></td>
</tr>
<tr>
<td>Potable water supply</td>
<td>Mostly centralized, wells and natural water reservoirs</td>
<td>Well and water ponds</td>
<td>Underground sources (deep aquiferous horizon)</td>
</tr>
</tbody>
</table>
5. Preparedness to Respond

5.1. The system of operational management of oil spill response in the Company, including oil/oil products spills

To comply with the Russian legislation and applying to the Best International Practice, the Company established and maintains the following Emergency Response Management Bodies:

The Sakhalin Energy’s response management system is based on an Incident Command System (ICS) organization and is compatible with the structure of emergency rescue services and teams of the National Russian Federation Unified Emergency Prevention, Preparedness and Response System (RSChS). The scheme of the structure is shown in Fig. 3.

Fig. 3. Organization of Emergency Response Command and Control Bodies in Sakhalin Energy

- **Coordination Body.** Company’s Committee on Prevention and Response to Emergencies and Fire Safety (Company’s KChS & OPB);

- **Standing Management bodies.** Emergency Response Management Team (ERMT) with support of departments and divisions of Sakhalin Energy, which may be mobilised in an emergency and also those dedicated to emergency management, HSE, Security departments, Logistic section, External Affairs and the Finance department and other if required.

- **Day-to-day Management Bodies:**
  1. **Duty Dispatcher Service** (DDS 2500) of the Company (Emergency Call Centre) in Yuzhno-Sakhalinsk. The duty and reference service, where bilingual (speaking Russian and English) staff is always available, receives all urgent communications. If a notice of emergency or threat thereof is received, the duty operator quickly connects to emergency coordinator (EC).
  2. **Emergency Coordination Team** (ECT). The ECT provides support to asset emergency Site Control Team to small spill on the territory of facilities. In case of larger spills, especially spills spreading outside the boundaries of the site, SRC assumes control over all accident response works.
  3. **Crisis Management Team** (CMT). The Crisis Management Team (CMT) controls those aspects of any incident that threaten the business (commercial) activity or reputation of the Company. In case of an emergency, CMT interacts with outside organisations, shareholders and lenders, the public and non-governmental organisations, relatives of
injured Sakhalin Energy and contractors’ employees, or injured representatives of customers.

4. For the pipeline transport system (PTS) this is the **Operations Control Room** (located at OPF). The Operations Control Room of onshore transport pipeline system is responsible for 24 hour/day control and monitoring of PTS activities under the management of the coordinator of PTS central control station.

- **Site Control Team (SCT)**

Each pipeline maintenance depot (PMD) and Booster station 2 (BS-2) has an asset Site Control Team. The team is headed by nominated Site Controller (SC). SCT ensures emergency activities directly at its operations facility.

The structure of the asset emergency operations team is demonstrated in figure 4, and functions of its principal members are listed below.

![Fig. 4. Structure of PMD Site Control Team (SCT)](image)

- **Emergency Response Manpower.** Company’s has own certified Non-professional ERT (NERT) and contracted Professional ERT (PERT); they are Onshore and Offshore Tier 1 OSR Contractors. Asset ERTs include personnel of NERT and rescuers of PERT.

The SC manages OSR operations directly at the emergency spill location. The functions of SC at the facility during response to emergency spills of oil/oil products include:

- Direct the response team to the spill site;
- collect factual information on the emergency event;
- evaluate accident severity;
- ensuring repair of pipeline or other source of the spill (unless unsafe);
- monitoring slick movements and behavior;
- determining the extent of risk connected with further operations (deciding on shutdown of process operations);
- deciding on evacuation from the emergency section;
- submitting to EC and other stakeholders a report on the nature of the failure and actions taken; and
- request for additional medical, fire and other assistance in emergency situation, if required.
Site Controller at the facility is responsible for operational management of emergency (oil) response activities from the asset emergency operations management center, which is available at each pipeline maintenance depot (PMD) or operations facility.

5.2. Process of Notifying of an Oil Spill

All employees of Sakhalin Energy and its contractors must promptly notify their immediate direct Superior at the Facility of all detected condensate, oil and oil product spills, and take safety measures for spill response. The notification diagram is shown in Fig. 5.

Information on spills detected by coordinator of the PTS control station shall be immediately provided by telephone or fax to Site Controller (SC) of PMD site.

Table 9. Superiors at facilities.

<table>
<thead>
<tr>
<th>Facility /Section</th>
<th>Senior manager at the facility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emergency response section Nogliki</td>
<td>Site Controller (SC) at PTS pipeline maintenance depot (PMD) in Nogliki settlement</td>
</tr>
<tr>
<td>Emergency response section OPF</td>
<td>SC at PTS: PMD OPF</td>
</tr>
<tr>
<td>Emergency response section Yasnoye</td>
<td>SC at PTS: PMD Yasnoye</td>
</tr>
<tr>
<td>Emergency response section BS-2</td>
<td>SC at PTS: PMD Gastello (BS-2)</td>
</tr>
<tr>
<td>Emergency response section Sovetskoye</td>
<td>SC at PTS: PMD Sovetskoye</td>
</tr>
<tr>
<td>Emergency response section Prigorodnoye</td>
<td>SC at PTS: PMD Prigorodnoye (LNG/ OET)</td>
</tr>
<tr>
<td>Repair sections at pipeline</td>
<td>Head of repair activities or head of repair team</td>
</tr>
<tr>
<td>Any operational or working facility</td>
<td>Senior person responsible for general management of the facility</td>
</tr>
</tbody>
</table>

Any person who has detected an oil spill or oil film (Observer) should (unless unsafe):

- stop hydrocarbon leak from the source, if technically possible (e.g., leakage occurs within the operational site of the facility);
- remove possible ignition sources or other hazards in the immediate vicinity of the spill point;
- take urgent actions to prevent spread of oil, particularly its penetration in water bodies and watercourses (unless such acts lead to a hazardous situation); and
- notify of the spill or oil film the nearby Person in Charge (Line Manager) or Site Controller. The head of operations at the section should promptly report of the emergency situation to the Site Controller.

The person that has detected a spill shall notice and inform of at least the following:

- place and source of the spill (equipment, vessel or facility);
- time of detection and time of the failure, if it can be determined;
- any injury of the staff connected with the failure; and
- actions taken and their efficiency.
5.3. Alarm

Each PMD has its own gas/fire alarm system and a local annunciation system. If required, SC may use emergency alarm or make an announcement by local broadcasting system.

The SC should take immediate actions to ensure safety. They shall include at least the following:

- Verbal notification of the staff which is in the immediate vicinity of the spill point; notification of other staff by radio or local annunciation system;
- To announce an alarm or respond to the announced alarm in accordance with the emergency procedures adopted at the facility or PTS as a whole;
- To assess hazards and immediate actions in respect of:
  - fire or explosion hazard;
  - leakage of gas and hazardous evaporation (as a possible solution, suspending air intake for residential zone and disconnection of low-important air intakes in machine room may be considered);
  - need of evacuation from the emergency area;
  - possible damage (rendering assistance should be considered);
  - possible risk for the staff, unless normal work is suspended;
- To act in accordance with the worst-case emergency (oil) scenario procedures until detailed information of the spill is obtained;
- To request, if appropriate, medical, fire and other emergency support.
- To decide on the need of special safety measures near the spill source;
- To decide on the need of establishing a special restricted area; and
- To ensure use of personal protective equipment (PPE) by all people in the spill area. In case of a fresh spill of crude oil or condensate, at least one person in the group should have an explosimeter or gas detector.
5.4. Preliminary assessment of emergency situation

Upon obtaining information of a spill, the SC at the facility concerned shall preliminary assess the emergency situation and the possible tier of response. The assessment of the spill should be based on the analysis of detailed data of the failure.

5.5. Primary notification

Personnel at facilities is informed of emergencies and civil defence signals over the telephone, radio and radio telephone communications, and the personnel of PMD and BS-2 sites is alarmed by public address system. A direct telephone line is also allocated to call the Civil Defence and Emergency Office of the Sakhalin Oblast.

The procedures and sequence of notification and reporting of the failure depend on the method and circumstances of detecting the leakage.

If a leakage from pipeline is detected by monitoring equipment, the Coordinator of the central control station of PTS shall immediately notify the Head of Operations (Operation Manager) of PTS and Head of PMD (Site Controller) responsible for the respective section of the pipeline. The information is to be provided by telephone (personally or through the emergency service line) and by fax.

If information of a spill at pipeline is received, the Operation Manager of PTS must immediately notify the duty EC.

If the leakage is detected by staff of the operations facility (section) or the pipeline maintenance team, the Site Controller of the facility should be notified immediately who, in turn, should promptly notify the duty Emergency Coordinator (EC) and Head (coordinator) of the central control station of PTS by telephone. After the telephone report, SC of the facility sends to the duty EC a fax copy of filled in OSR-01 form. If the report passes through the central control station of PTS, the Coordinator of the central control station will notify EC and SC accordingly. SC should make sure that the report is received by the Emergency Coordinator (EC), and then all further reports and communications shall be sent to EC directly.

If information of a spill at the pipeline is received, Operation Manager of PTS should promptly notify the on-duty EC.

Upon receipt of the spill notice, the EC shall immediately notify:

- Crisis Manager;
- Manager of PTS production facilities;
- HSE Manager; and
- relevant governmental authorities.

Based on the results of assessment of the resources and equipment required for emergency response, EC may decide on mobilization of the Emergency Coordination Team (ECT).

The response teams sent to the spill point include specialists in clarification of scale of the spill (volume, pollution area, pollution depth) and specialists in forecasting propagation of emergency. By the time of arrival of PMD, such specialists shall provide information of scale, distribution and nature of contaminated area.

In case of a wide-scale spill or considerable duration of OSR, special teams may be formed for situation monitoring purpose. The situation monitoring team consists of at least three persons, including head of the team.

The team members should wear protective clothes in accordance with the occupational safety requirements and should have the following:

- personal protective equipment: filtering gas masks, oil-resistant rubber boots, a spare set of protective clothes;
- restricting signs to the oil (oil product) emergency place with inscriptions "Danger!", "Explosion hazard!", "Do not use fire!", "Don't smoke!", "Passage is closed!", "Bypass" with bypass direction indicated;
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• red flags on poles;
• tools for installation of the signs (shovels, hammer, axe, saw);
• blast-resistant lights;
• wheel for closing/opening line valves;
• safety belts;
• fire fighting primary means (fire extinguishers, fireproof blanket); and
• documentation package: brief profile of oil pipeline, oil pipeline route passage diagram, forms of orders/applications to police office, radio communication scheme, oil pipeline route description, as linked to terrain.

All field teams maintain contact with SC or communication specialist (dispatcher) of the respective PMD.

After determination of the exact place of failure, actions shall be taken to:
• assess nature of damage and scale of the emergency;
• ensure safety of the staff involved in OSR operations, life support facilities located within the oil (oil product) spill impact area;
• assess preliminarily the scale of the oil (oil product) spill;
• forecast the tier of emergency;
• arrange operational control and monitoring of the oil (oil product) spill area; and
• arrange collecting, exchange and analysis of information regarding the oil (oil product) spill.

5.6. Response resources

The required resources and specialized technical facilities are estimated subject to the requirements of clause 5 of the “Basic requirements to the development of plans for preventing and response in cases of emergency spills of oil and oil products” approved by RF Government Resolution No. 613 dated 21.08.2000. The required resources and facilities for oil (oil product) spill response are estimated on the basis of maximum possible volumes of oil (oil product) spill at the PTS, simulation of oil pollution propagation and normative requirements to time limits of the activities relating to containment of a spill and oil pollution recovery. The estimation was carried out subject to the time of gathering PMD under an oil (oil product) spill alarm and delivery of the team to emergency site.

Sufficiency of PMD resources and facilities is assessed on the basis of the estimated characteristics of a maximum estimated oil spill for a time interval allocated for containment:
• time for containment of an oil spill on water (river crossings) is equal to 4 hours; and
• time for containment of an oil (oil product) spill on shore - 6 hours.

5.7. Response resources – staff

All the activities relating to response to a local emergency (oil) (Tier 1) are headed by Sakhalin Energy. The respective rescue and other urgent activities are performed by duly certified PMD rescue formations.

In order to carry out emergency (oil) response activities, Sakhalin Energy may engage duly certified own professional and non-professional formations, as well as the resources and facilities of other entities' PMD under the Company's OSR Plan.

Sakhalin Energy's contractor responsible for Tier 1 onshore OSR has a permanent staff of professional rescuers. In case of a major emergency (oil), 40 non-professional rescuers may be mobilized additionally to help the rescue formation of Sakhalin Energy's contractor responsible for Tier 1 onshore OSR. Arrangement of two non-professional formations, one of them based in Yuzhno-Sakhalinsk, the other based in Poronaysk, is envisaged.

The PTS staff includes own maintenance teams which passed specialized training in emergency response and emergencies, including spills of oil and oil products. If required, they can be assisted by staff specially trained in coordination of emergency response (coordination group), as well as by OSR
contracts' staff. The latter is subdivided into those of the Contractor responsible for Tier 1 onshore OSR and the Contractor responsible for Tier 1 offshore OSR.

Sakhalin Energy's contractor responsible for Tier 1 offshore OSR has a staff of professional rescuers on board of freighted specialized OSR vessels. Along with this, a team of response to onshore oil spills is based in Nogliki. This formation includes:

- ten instant readiness rescuers; and
- a team of forty trained high readiness rescuers; twenty of them are ready to come to Nogliki within 2 hours after alarm, the other twenty – within 8 hours.

Table 8. Rescue formations for response to emergency / oil spill based at Sakhalin Energy facilities

<table>
<thead>
<tr>
<th>Type of spill</th>
<th>Facility/location</th>
<th>OSR duty formation at the facility(^{(1)})</th>
<th>Other staff of SEIC's SCT</th>
<th>Tier 1 OSR Contractor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spills on terrain and inland water bodies</td>
<td>Nogliki</td>
<td>12</td>
<td>-</td>
<td>10 + 40(^{(2)})</td>
</tr>
<tr>
<td></td>
<td>OPF</td>
<td>7</td>
<td>-</td>
<td>10 + 80(^{(3)})</td>
</tr>
<tr>
<td></td>
<td>PMD Gastello (BS-2)</td>
<td>8</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td></td>
<td>PMD Yasnoye</td>
<td>8</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td></td>
<td>PMD Sovetskoye</td>
<td>8</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Prigorodnoye (OET/LNG)</td>
<td>8</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>ECT</td>
<td>Yuzhno-Sakhalinsk</td>
<td>prepared by EC</td>
<td>10</td>
<td>no data</td>
</tr>
<tr>
<td></td>
<td>other ECT staff</td>
<td>80</td>
<td>no data</td>
<td></td>
</tr>
</tbody>
</table>

\(^{(1)}\) Trained operators of equipment.
\(^{(2)}\) Staff of Sakhalin Energy off-shore Tier 1 OSR contractor available on demand: 10 professional rescuers and 40 non-professional rescuers.
\(^{(3)}\) Staff of Sakhalin Energy on-shore Tier 1 OSR contractor available on demand: 10 professional rescuers and 80 non-professional rescuers.

The support is ensured at the cost of onshore resources and facilities of Tier 1 OSR contractors.

5.8. Response resources – equipment

The following technical facilities and equipment are expected to be used for an oil spill response at onshore pipeline facilities:

- containment facilities using boom lines with assembling of an oil-recovery order using a boom-setting boat; temporary boom lines in case of possible leakage of oil/oil products in rivers;
- skimmers for recovery of oil within permanent and sorbent booms;
- sorbents and materials for clearance of the closed water areas within boom lines;
- elastic floating tanks for gathering oil off-shore;
- backup tanks and auxiliary floating craft for temporary storage of oil/water mix; and
- engaged resources and equipment at the base area and all the available resources and equipment (higher than the local response tier), where own resources and facilities are insufficient.

The equipment is distributed between Pipeline Maintenance Depots (PMD) in accordance with the risk assessment results and the identified ecologically vulnerable areas and characteristics of operational activities. PMD are arranged at the following locations:

- Nogliki settlement (on-shore and off-shore);
- OPF site (on-shore);
- Booster station 2 site (on-shore);
- Sovetskoye community (on-shore);
- Yasnoye community (on-shore);
- LNG and OET site (on-shore and off-shore); and
- Kholmsk port (auxiliary off-shore).
5.9. Response time

Mobilization of PMD equipment, following drill results, is not more than 30 minutes after receiving emergency (oil) notification. A considerable part of equipment and technical means are stored in packed and ready to transport condition as rapid deployment pack (RDP), a part of which is pre-loaded and stays permanently in Ural motor vehicles available at all PMD.

As it was mentioned above, delivery of equipment to the emergency spill point and its deployment should take not more than 6 hours. The possibility of access to spill point may be complicated by unfavorable conditions, particularly pipeline route’s crossings via rivers and watercourses remote from site facilities. In such cases, use of special rapid deployment packages for transport by helicopter is assumed.

In order to deliver equipment and staff to emergency oil spill location, helicopters can be used at the onshore PTS.

The helicopter landing decks along the onshore pipeline are located:
2 units in the Nogliki District, at BSV 18 and 22;
1 unit in the Makarov District at oil valve 9;
1 unit at Yasnoye PMD;
1 unit at BS-2 PMD;
1 unit at Sovetskoye PMD.

The estimated time for mobilization, delivery by road and deployment of equipment and technical means for protection of bays at the north-east coast of Sakhalin Island is equal to 4 hours (from PMD in Nogliki settlement to Lunskoy bay coast), plus up to 1 hour for unloading. The time of access to various points at the pipelines route is different to a considerable extent. When estimating response time, such limitations as weather and ice situation are to be taken into account. These parameters affect the efficiency of response time and OSR methods applied.

5.10. Preparedness and Assurance

Assurance of preparedness of OSR resources and facilities is envisaged in three modes:

1. in the mode of everyday activities:
   a. training of PMD personnel (training requirements, levels and time schedules);
   b. assurance of regular update of the OSR plan;
   c. maintaining service capability and technical maintenance of OSR equipment.
2. advanced readiness mode: the appropriate procedure and assignment of responsibilities are presented in the emergency response plan for the facilities of Prigorodnoye Complex; and
3. in the emergency mode: the appropriate procedures and assignment of responsibilities are presented in this OSR plan.

Within the framework of maintaining service capability, the following is performed at the facilities:

- examination of process units (equipment elements) on which spills of maximum volume may take place, or those characterized by maximum probabilities of spills;
- timely and regular serviceability check of equipment and tools utilized for accidental spill containment and elimination, where necessary – performance of repair and overhaul thereof;
- evaluation of the available resources and equipment and additional supply where necessary; and
- conducting drills and comprehensive emergency training exercises for containment and elimination of hydrocarbon product spills.
5.11. **Maintenance of equipment**

Management of the facility is responsible for maintenance of OSR for onshore PTS. The duties of the appointed manager of OSR equipment include ensuring proper operability and safe operation of the equipment. Such manager may be the facility's manager responsible for maintenance or OSR Contractor.

Inspections and tests of OSR facilities are carried out in accordance with maintenance instructions on a periodical basis, and both before and after the drills and exercises with use thereof.

The plan of staff training, schedules and contents of the drills and exercises, plans and programs of technical training are developed and approved by the Commission for prevention and response to emergency situations and securing fire safety of Sakhalin Energy. The timeframes of the special trainings, drills and exercises are coordinated in advance with all participants of the exercises.

The professional training of the staff involved in OSR is arranged by Sakhalin Energy through its Tier 1 OSR Contractors. Other contractors of the Company must arrange training of their staff in OSR. The training is carried out in due course in accordance with the existing standard requirements.

Exercises in emergencies response are carried out on an annual basis. Exercises in winter, with real deployment of equipment, shall be carried out at least once each two years.

Drills and exercises are based upon simulation of emergency situations and can involve single, several or all crews and sectors of Emergency Coordination Team (ECT) or Crisis Management Team (CMT).

Specialized tactical exercises, with the duration of up to 8 hours, with the participation of Sakhalin Energy ECT, CMT, and facility-based emergency response teams are conducted every three years, and with the participation of instant readiness detachments (specialized OSR contractors of Sakhalin Energy) – once a year.

If necessary, this OSR Plan is reviewed and adjusted, based on the results of drills and exercises.

5.12. **National and International Resources**

Additional OSR resources and equipment may be engaged in response to emergency (oil) under the existing agreements with the sector's companies or interaction agreements with the governmental authorities. The need of engagement of additional OSR resources and equipment is determined by the location, scale and nature of emergency (oil).

Equipment belonging to governmental authorities and organisations can be used in case of an oil spill at Prigorodnoye offshore facilities via district or oblast KChS and OPB.

If necessary, in case of an oil spill of local or territorial tier, the respective KChS can engage emergency rescue services and fire brigades based on Oblast territory, as well as staff from public health departments and internal affairs departments of municipalities.

Personnel and equipment of Russian MChS and civil defence forces based in the Far East, DVBASU, and other regional resources can be engaged in response operations in case of spills of the regional tier.

In case of federal tier spills, resources of Russian MChS, State Marine Emergency Rescue Service of the RF Ministry of Transport (Gosmorspassluzhba), Centre for Emergency, Rescue and Ecological Operations (CREO or Ekospas) situated in Moscow with branches in the Far East, including Sakhalin can be involved, as well as international resources.

On the basis of bilateral agreement on mutual assistance with ENL, Sakhalin Energy has access to equipment and services of this company in the field of oil spill response. This equipment is located in Nogliki and at ENL OPF (Chayvo field).
Memorandum of Understanding between Sakhalin Energy, Elvary Naftegaz, NK Rosneft-SMNG, and Petrosakh was signed in January 2005. This document is aimed at strengthening the capabilities of all parties in the OSR field by agreement to provide to each other mutual assistance including personnel and equipment in the event of a spill.

Tier 3 response will most likely require coordination of both Russian and international manpower and resources.

The following international resources of Oil Spill Response Limited (OSRL) may be engaged through STASCO and Shell Response Ltd. companies, which are located:

- At the base in Southampton, UK, and
- In Singapore.

6. Compliance with the Russian Legislation and Best International Practice

The "Plan for Oil and Oil Product Spill Response for Onshore Pipeline System" is developed in accordance with requirements of the Russian legislation with regard to emergency Response, including oil spills. The contents of the Plan takes into consideration a wide range of regulatory requirements and recommendations with respect to contents and structure of oil spill response plans indicated in “Corporate Oil Spill Emergency Response Standard”.

The main normative acts in this field are:

- RF Government Regulation "On High Priority Actions for Accidental Oil Spill Response" of 20.08.2000 No. 613;
- Order of Ministry of Natural Resources of Russia "On Approval of Instructions on Determining the Lower Level of Oil or Oil Product Spill for Classifying an Accidental Spill as Emergency" of 3.03.2003 No. 156;
- Ordinance of Sakhalin Oblast Administration "On creation of the Sakhalin Territorial Subsystem of the Unified State System for Emergency Response" of 19.10.2005 No. 189-pa;
- Ordinance of Sakhalin Oblast Administration "On Approval of Requirements for Development of Oil Spill Response Plans in the Territory of Sakhalin Oblast" of 10.11.2005 No. 203-pa;
- Directive of Sakhalin Oblast KChS and Fire Safety Department "On the Procedure of Agreeing and Approval of Oil Spill Response Plans in the Territory of Sakhalin Oblast" of 15.11.2005 No. 73; and
- Russian Federation Government Regulations Nos. 613 and 240, Order of MChS of Russia No. 621, and Ordinance of Sakhalin Oblast Administration No. 203-pa (as revised by Ordinance of Sakhalin Oblast Administration of 16 February 2007 No. 31-pa) establish a number of requirements for such plans.

When developing the Sakhalin Energy’s OSR Plan, corresponding recommendations of the Lenders and Shareholders, Corporate standards of Shell Corporation, and requirements of international agreements and conventions ratified by the Russian Federation were taken into account.

The main documents are International Conventions ratified by the Russian Federation:

2. 1992 International Convention on Civil Liability for Oil Pollution Damage i.e. the Civil Liability Convention (1992 CLC)


5. 1973/78 International Convention for the Prevention of Pollution by Ships (MARPOL 73/78)


Shell documents:

1. Guidelines for Shell Companies and Business Units on Preparedness, Response and Compensation for Oil and Chemical Spills (as of June 2003)


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<th>Acronym</th>
<th>Description</th>
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<tr>
<td>ATMOS PIPE</td>
<td>Pipeline leak detection software</td>
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<td>BVS</td>
<td>Block Valve Station</td>
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<td>CLC</td>
<td>Civil Liability Convention</td>
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<td>Crisis Management Team</td>
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<td>HSESAP</td>
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