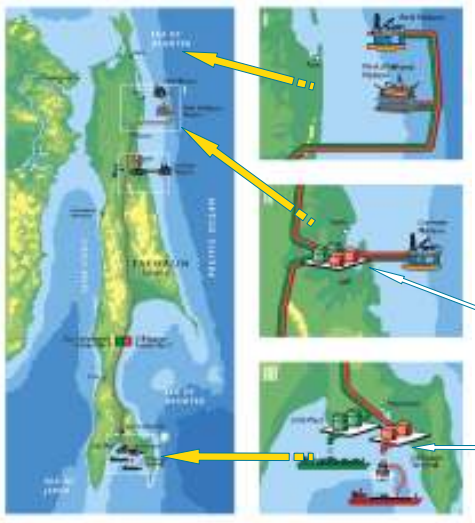
Sakhalin II Phase 2

Oil Spill Response Preparedness for Expansion to Phase 2 Operations

Presentation for the
Petroleum Association of Japan
Oil Spill Symposium
February 2008

Phase 2 Development



- Piltun-B platform.
- Piltun-A year round production.
- Lunskoye-A platform.
- Onshore processing facility (OPF).
- Oil and gas pipelines.
- LNG plant and oil export terminal.

Sakhalin Energy
THE NEW ENERGY SOURCE FOR THE ASIA PACIFIC

2

Sakhalin Energy Oil Spill Response: Objectives

- To establish a world class OSR system that will provide the best possible protection to the environment in the event of a spill.
- To establish a scientifically based and practically focussed work programme that will sustain longer term development of OSR within SEIC, on Sakhalin and within the region.
- To cooperate with municipal, Sakhalin Oblast and Russian Federal authorities in developing wider OSR capabilities.

Sakhalin Energy
THE NEW ENERGY SOURCE FOR THE ASIA PACIFIC

3

Sakhalin Energy Response Preparedness

Sakhalin Energy response capability is supported by:

- Sakhalin Energy Emergency Response Organisation
- Participation in the RF Unified Command
- Oil Spill Response Plans and supporting documents
- OSR Work Programme
- OSR Equipment Stockpile and Professional OS Responders
- International equipment and personnel resources of Oil Spill Response Limited (OSRL, UK) & East Asia Response Limited (EARL, Singapore)
- Cooperative OSR agreement with ENL and MoU with other oil companies on Sakhalin Island
- MoU with Marine Disaster Prevention Centre of Japan
- Spill prevention systems; hardware coupled with operating and maintenance procedures

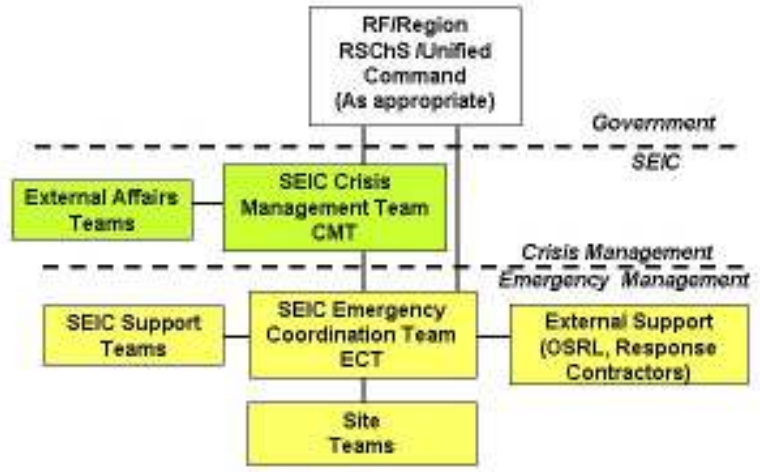
Sakhalin Energy
THE NEW ENERGY SOURCE FOR THE ASIA PACIFIC

4

Challenges

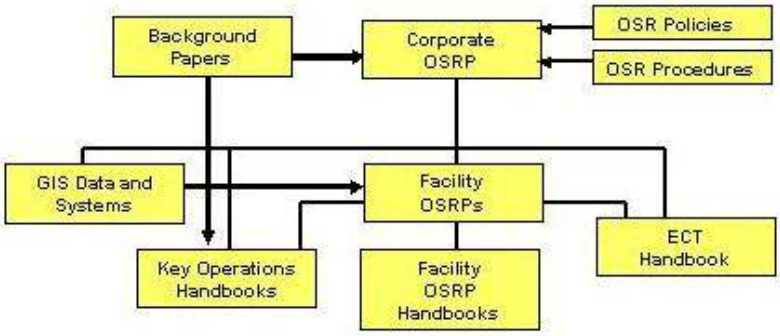
- Cultural Considerations
- Effects of Climate on Oil Behaviour
- Oil Spill Response in Ice Conditions
- Environmental and Social Sensitivities
- Remoteness and Infrastructure
- Equipment Suitability
- Trans-boundary Issues

Emergency Response Organisation



RSChS – Unified State System for Prevention of and Response to Emergencies

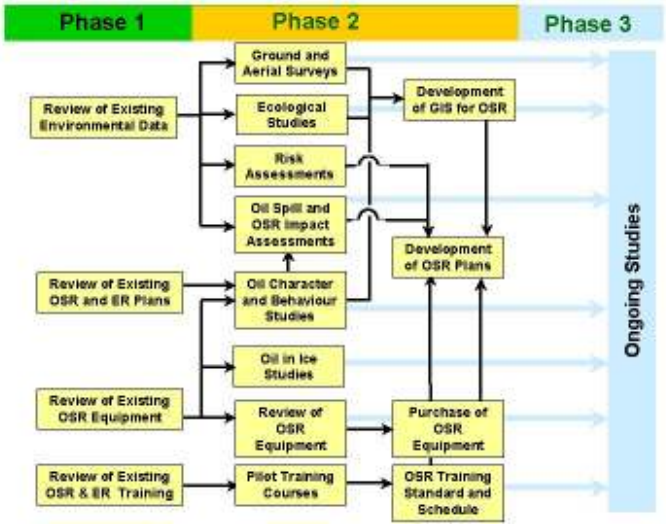
Sakhalin Energy OSR Documentation



Sakhalin Energy
THE NEW ENERGY SOURCE FOR THE ASIA PACIFIC

7

OSR Work Programme



Sakhalin Energy
THE NEW ENERGY SOURCE FOR THE ASIA PACIFIC

8

Effects of Climate on Oil Behaviour

- Character of Fresh Oil and Weathering Behaviour
  - Specific Gravity
  - Viscosity (at various temperatures)
  - Pour point
  - Wax content
  - Asphaltene content
  - Emulsification potential and water miscibility
  - Evaporative Loss
- Biodegradation
- In Situ Burning
- Effectiveness of Chemical Dispersants

Sakhalin Energy
THE NEW ENERGY SOURCE FOR THE ASIA PACIFIC

Oil Spill Response in Ice Conditions

- The presence of ice does present challenges for OSR. High ice cover inhibits access by response vessels and also limits the range of recovery devices that can be deployed.
- High ice cover also inhibits the spread of oil and slows trajectory.
- Sakhalin Energy has reviewed, and is continuing to review the available equipment for oil recovery in ice conditions. These are being assessed against the conditions that exist offshore and onshore Sakhalin Island.
- Ongoing development is carried out through continuing Oil in Ice studies and participation in industry R & D programmes.

Sakhalin Energy
THE NEW ENERGY SOURCE FOR THE ASIA PACIFIC

Effectiveness of OSR Strategies

Offshore equipment deployment in winter conditions
December 2007

Sakhalin Energy
THE NEW ENERGY SOURCE FOR THE ASIA PACIFIC

11

Remoteness and Infrastructure

Field survey of island road & bridge infrastructure

Sakhalin Energy
THE NEW ENERGY SOURCE FOR THE ASIA PACIFIC

12

Remoteness and Infrastructure

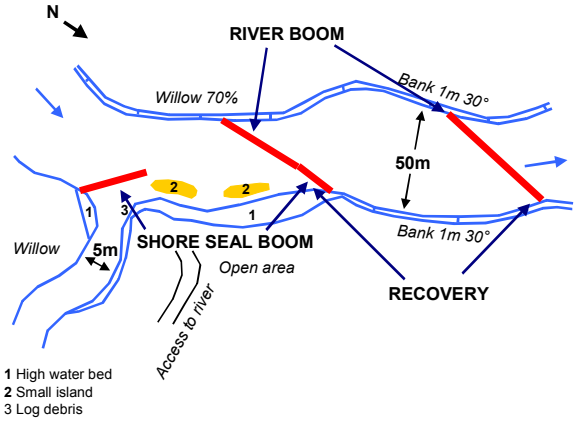
Field survey of shoreline & river accessibility and physical characterisation

Field Survey Results

- Identification of access points to the shoreline and rivers in areas downstream of pipeline crossing
- Description of river characteristics by means of coded forms, pictures and sketches
- Mapped access routes with road and bridge conditions
- Shoreline characteristics recorded in several formats: written forms, ground-truth pictures and aerial video
- Geo-referenced database
- Information for OSR Planning and Emergency Responders

Site specific response

Extensive field data has allowed for the development of site specific response strategies high water, low water and winter conditions.



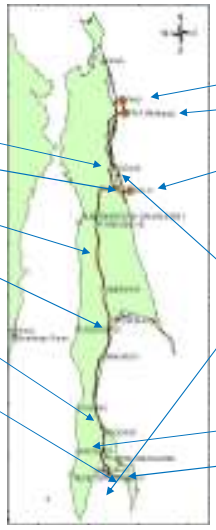
Fit-for-Purpose Transportation

- **Equipment and deployment methods chosen with the consideration for logistics challenges.**

Vessels, Depots & Equipment Deployment

Onshore Equipment

- Pipeline Maintenance Depots:
  - Nogliki
  - OPF
  - Yasnoye
  - Gastello (BS2)
  - Sovetskoye
- Prigorodnoye OSR Garage



Offshore

- PA-B
- PA-A
- Lun-A
- Aniva Bay

Marine Equipment

- Nogliki
- Kholmsk
- Prigorodnoye

Sakhalin Energy
THE NEW ENERGY SOURCE FOR THE ASIA PACIFIC

Ice Class Vessels

Pacific Endeavour

Smit Vessel

Sakhalin Energy
THE NEW ENERGY SOURCE FOR THE ASIA PACIF

Prigorodnoye: Marine and Shoreline Response

- Offshore, shoreline and near shore response equipment is stored at the marine emergency response depot.
- The list of equipment is extensive including small landing craft various booms, skimmers, temporary oil spill storage tanks and sorbents, with total of approx 150 different items stored in a dedicated warehouse.

Sakhalin Energy
THE NEW ENERGY SOURCE FOR THE ASIA PACIFIC

19

Prigorodnoye Marine Emergency Response Depot

- Line boats are 15m in length, 1.5m draft and with 8 tonnes bollard pull ideal for ease of deployment and to assist tugs with "J" type formation of boom.

- Boom ramp is integral with marine base allowing two booms to be set up ready for immediate deployment.

Sakhalin Energy
THE NEW ENERGY SOURCE FOR THE ASIA PACIFIC

20

Onshore Emergency Response Depots

Sakhalin Energy
THE NEW ENERGY SOURCE FOR THE ASIA PACIFIC

Equipment Procurement

- Vessel-based OSR Kits
- Booms
- Skimmers
- Rapid Deployment Packs
- Storage Tanks
- All Terrain Vehicles
- River Vessels
- PPE & Misc. Equipment

Total 1400 Line Items

\+
Marine Vessels
Heavy Equipment
Transport Vehicles

Sakhalin Energy
THE NEW ENERGY SOURCE FOR THE ASIA PACIFIC

Training & Exercises

Sakhalin E
THE NEW ENERGY SOURCE

Training & Exercises

Exercises for Oil Spill Response teams in winter conditions December 2007

Sakhalin Energy
THE NEW ENERGY SOURCE FOR THE ASIA PACIFIC

Health and Safety

Communications, Climate, Natural Hazards

OSR Trans-boundary Issues

Potential for oil spills to enter Japanese waters.
SEIC have modelled spills in Aniva Bay and La Perouse Strait as well as northeast Sakhalin.

Cross border response coordination.
- MoU with Marine Disaster Prevention Center of Japan
- Hokkaido Regional Oil Spill Response Plan
- Spill reporting to Lenders, Shareholders and MDPC

Information Sharing
Hokkaido OSR Expert Committee

North West Pacific Action Plan (NOWPAP)

General Approach

- Strategies and methods in OSRPs are based on existing and proven techniques.
- Strategies and equipment selected represent world's best practice and best available technology.
- Sakhalin Energy OSR continues to assess new technology with a view to acquiring this and incorporating it into OSRPs.
- This an ongoing process and an ongoing commitment.

Sakhalin Energy
THE NEW ENERGY SOURCE FOR THE ASIA PACIFIC

27

Sakhalin II Phase 2

Oil Spill Response Preparedness for Expansion to Phase 2 Operations

End