

One indicative example on the Sakhalin II pipeline: same place during last four months

(according results of public monitoring conducted by
Sakhalin Environment Watch in 2007)



KP 461,0. The landslide on the left bank of the Krasnaya River right tributary. Dolinsk District.

A beginning of land slides processes. First land slide came down in May here, during a melting season. Construction in this area has been completed more than a year ago, however final restoration has not been completed.

July 02, 2007



KP 461,0. The landslide on the left bank of the Krasnaya River right tributary. Dolinsk District.

A large scope of backfilling soil over the laid pipes slid into the stream, shutting off water flow. Volume of the landslide is about 300 m³. For some purposes, silt fences were placed directly on the «body» of the landslides which was still moving.

August 31, 2007



KP 461,0. The landslide on the left bank of the Krasnaya River right tributary. Dolinsk District.

At the moment, the mass of the landslide is being eroded by the stream and stream waters flowing down the slope. Moreover, the growth of gullies has already been starting here. The SEIC's 'know-how' in the form of a short hurdle across the landslide, which has already come down, is taking no effect at all. The traces of the recently planted grass may be seen as narrow strips along the stream banks and beside the hurdle, which are slowing down neither the erosion processes, nor the landslide ones.

September 26, 2007



KP 461,0. The landslide on the left bank of the Krasnaya River right tributary. Dolinsk District. More than 4 months after the first land slide occurred on the slope, SEIC has not undertaken adequate, effective measures for control of land slides and erosion processes. Fences installed on the moving mud and very limited grass planting don't help at all.

July 02, 2007



KP 462,6. The landslide on the right bank of the left tributary of the Baklanovka River, Dolinsk District.
The landslide completely blocked the stream's bed, blocking water flow. An artificial pond has been created. Hydrological regime of the waterways was violated.

August 31, 2007



KP 462,6. The landslide on the right bank of the left tributary of the Baklanovka River, Dolinsk District.
No changed two months later

July 02, 2007



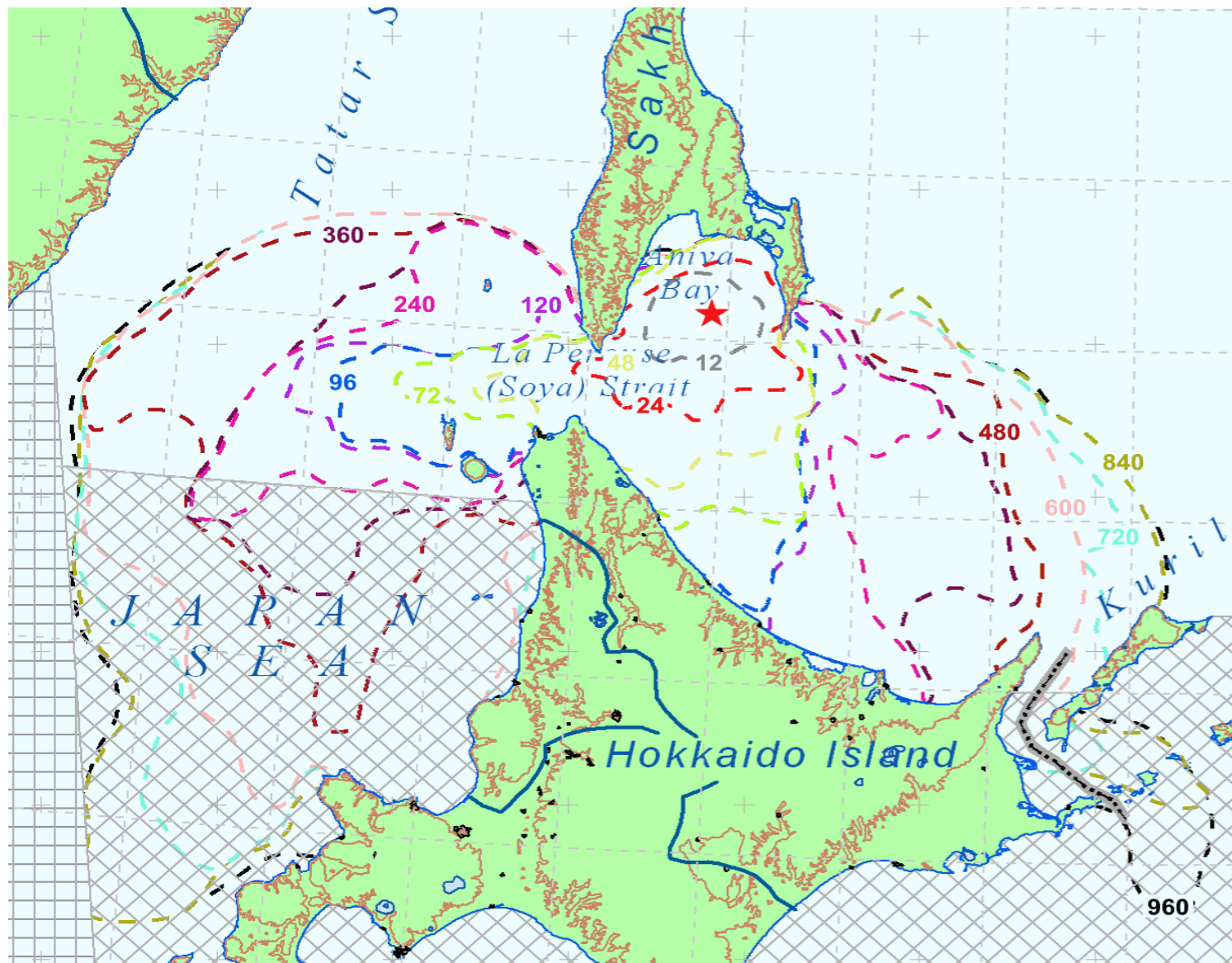
KP 462,6. The landslide on the right bank of the left tributary of the Baklanovka River, Dolinsk District.

August 31, 2007




KP 462,6. The landslide on the right bank of the left tributary of the Baklanovka River, Dolinsk District.

Trajectory Envelopes for Modelled Crude Oil Spill (from Tanker) Mid-Aniva Bay in Winter




Risk contributions for spills in Aniva Bay are as follows

RISK CONTRIBUTION – ANIVA BAY

| Category | Leak Frequency / yr | Risk, m³/yr | Risk Contribution |
|-----------------------|----------------------------|-------------------------------|--|
| TLU pipeline | 5.92E-04 | 1.03E-01 | 0.02% |
| TLU | 4.08E-02 | 1.79E+00 | 0.33% |
| Bunkering | 2.01E+00 | 3.94E-01 | 0.07% |
| <u>Tankers</u> | 2.04E-01 | 5.35E+02 | 98.99%  |
| Other Vessels | 1.85E-02 | 3.19E+00 | 0.59% |

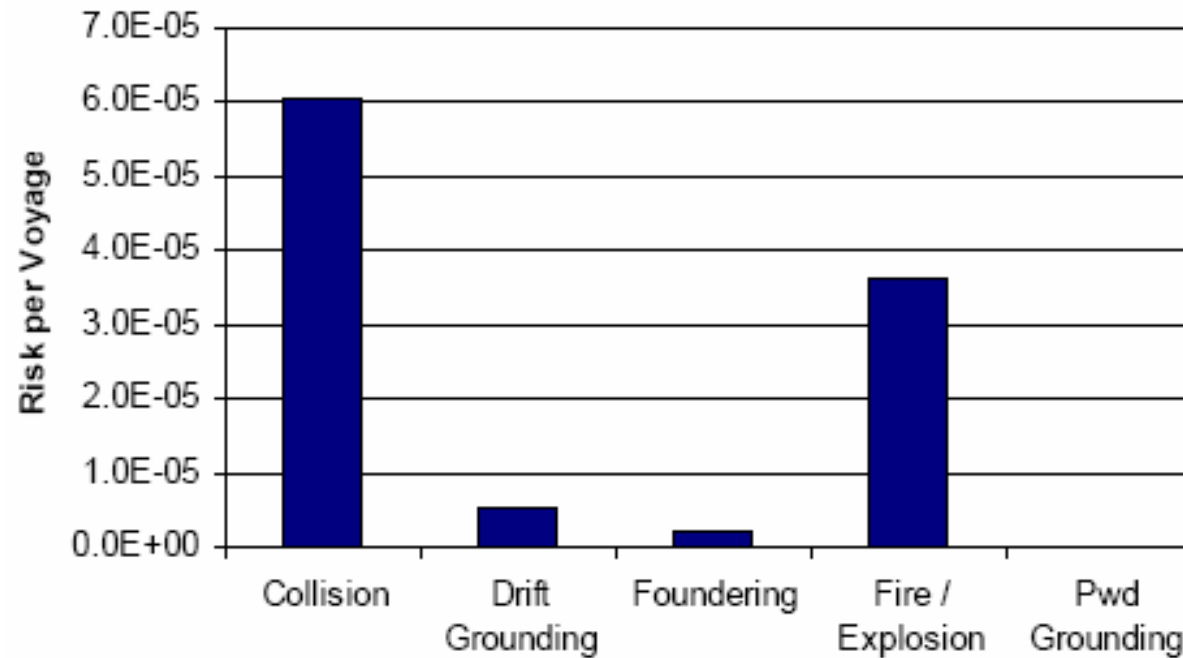
(Source: "Sakhalin II Phase 2 Marine Oil Spill Quantitative Risk Assessment", 2005)

MAXIMUM CREDIBLE SPILL SIZES (1000 YEAR RETURN PERIOD)

| Release Location | Description of Maximum Credible Spill Case | Maximum Credible Spill Volume, m ³ |
|-------------------------------------|--|--|
| PA-A (within platform safety zone) | Collision involving the PA SBV (100% full) resulting in rupture of 25% of fuel oil tanks | 239 |
| PA-B (within platform safety zone) | Large hole size release from PA-B pipeline / riser within platform safety zone, automatically detected and isolated | 282 |
| PA pipelines (midline) | Rupture of the PA-A pipeline in the midline (10 km offshore), automatically detected and isolated. | 416 |
| Lun-A (within platform safety zone) | Foundering of the Lun-A SBV (75% full) resulting in rupture of 50% of fuel oil tanks | 358 |
| Lun-A pipelines (midline) | Rupture of one of the 30" Lun-A pipelines at any location, automatically detected and isolated | 228 |
| <u>Aniva Bay (crude oil)</u> | Catastrophic leak from Aframax oil tanker at the TLU resulting in loss of substantial proportion of the cargo. Note: Assumes use of double hulled tankers only. | 45,000  |

(Source: "Sakhalin II Phase 2 Marine Oil Spill Quantitative Risk Assessment", 2005)

Shipping Risk Assessment for LNG/OET



Primary risks from ship-to-ship collision and fire / explosion

Accident Risk

- LNG Tankers: 1x / 51 years
- Oil tankers: 1x / 106 years

Shipping Risk Assessment for Port of Valdez (pre-Exxon Valdez accident)

- 1x / 241 years
- Exxon Valdez spill occurred 12 years after opening of oil terminal
- Ship accidents with oil spills happened before and after Exxon Valdez in Valdez Port



LNG Hazards:

Low Probability / High Consequence

o Fire hazard

- Liquid pool fires
- Vapor cloud fires

o Explosion hazards

- Confined vapor cloud explosions
- Unconfined vapor cloud explosions (UVCE)
- Boiling liquid expanding vapor explosions (BLEVE)



Test, conducted by the U.S. Coast Guard at China Lake, CA, in the Eighties.

LNG Tanker Truck Explodes in Spain - June 2002



Fig. 4. Central part of the tank.

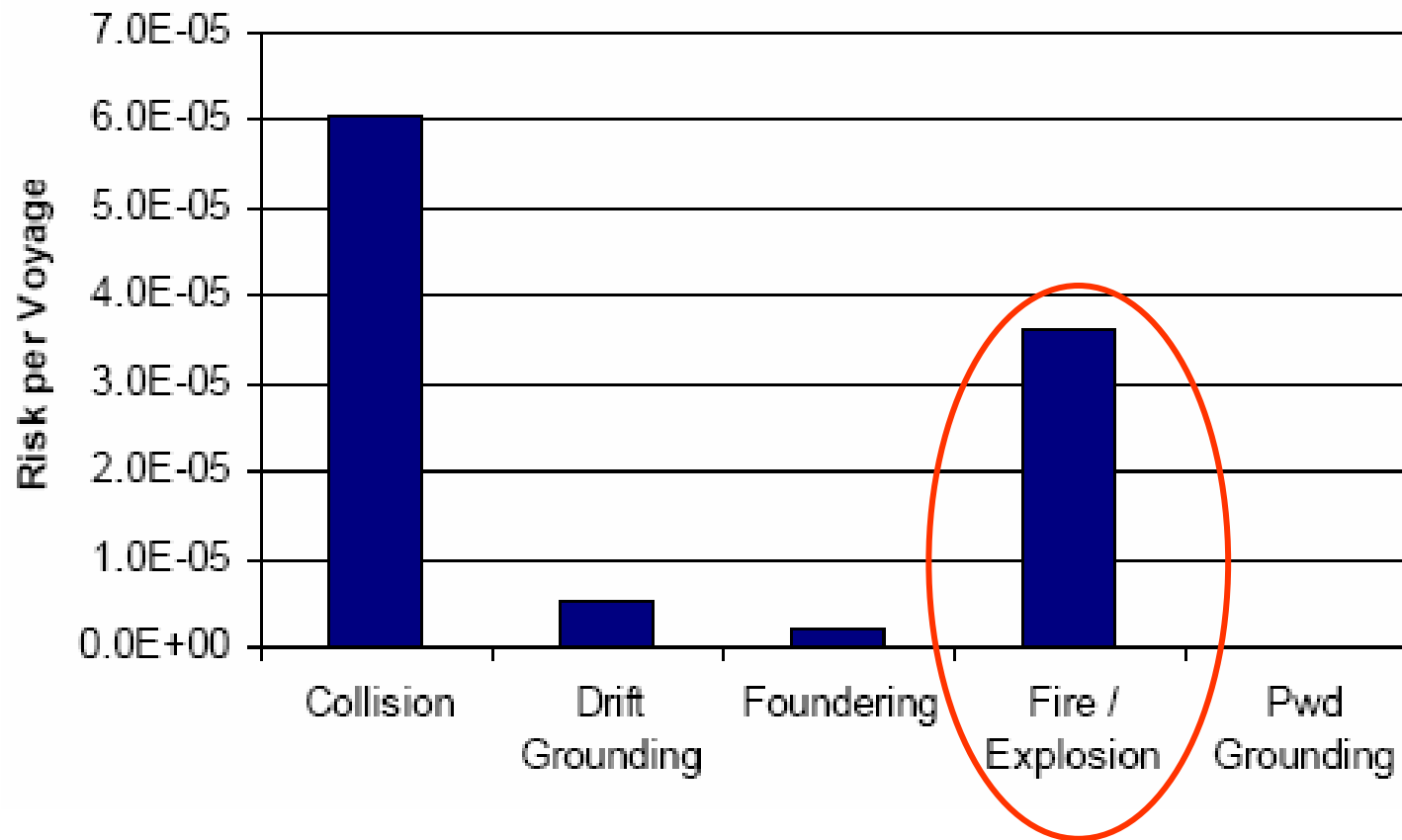


Fig. 2. Rear piece of the tank.



Fig. 3. Front piece of the tank.





Accident Risk

LNG Tankers: 1x / 51 years

Why Sakhalin Energy doesn't conduct LNG Hazards Risk Assessment???