OGP Guidance Note for interface between Pipeline Data Models and the SSDM

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O&G companies spend millions each year conducting offshore surveys:

- Pipeline Route Surveys
- Pipeline Pre-lay Surveys
- Pipeline As-built surveys
- Pipeline Inspection Surveys
- Sweep Debris Surveys
- Environmental Surveys
- Rig Site Surveys

The data acquired by these surveys is used for planning purposes, operational support and to manage risks.
Scope

• Focus on Industry Supported Data Models: PODS and APDM

• Similar mechanism may be adopted for the companies with internally developed pipeline data models

• Focused on integrating SSDM with the core of the pipeline data models

• Focus on the current version of the data models
Benefits of interface

• Fit for purpose storage of survey data between pipeline data models and the SSDM

• All relevant survey data are linked regardless of where they are stored, enabling easy query and retrieval of information across the SSDM and pipeline data models

• Complete track record of the activities (survey metadata, survey data and survey reports) on or around infrastructure throughout the asset lifecycle

• No duplication of data
Offshore Survey Data applicability to Data Models

**Pipeline Data Models**
- Supplied in various proprietary template structures for incorporation into Pipeline Data Models:
  - Centerline
  - Control Points
  - Pipeline Events
  - Transverse profile data (5 point listing)
  - Cathodic Protection Readings
  - Internal Inspections, etc.

**SSDM**
- Delivery requirements specified in OGP Guideline for the Delivery of SSDM:
  - Survey Extent
  - Bathymetry Soundings
  - Contours
  - Raster Data (MBES)
  - Imagery (SLS, Hillshaded Bathymetry)
  - Navigation (Survey Tracklines)
  - Chart Index
  - Seabed Sampling & CPT
  - Seabed and Geologic features, etc.

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- Pipeline As-Laid Survey
- Pipeline As-Built Survey
- Acoustic Pipeline Inspection Survey (SSS, MBES)
- Visual Pipeline Inspection Survey (ROV)
- As-Built Survey (structures positioning, jumpers, etc.)
- Metrology Survey
- Inline Inspection Survey
- Pipeline Route Survey
- Pipeline Pre-lay Survey
- Sweep (Debris) Survey
- Site Survey
- Bathymetry/topography (SBS/MBES/LADS) Survey
- 2D Seismic Survey
- 3D Seismic Survey
- 4D Seismic Survey
- Environmental Survey
- Geotechnical Investigation
### Storage of survey events based on Pipeline Survey Type

<table>
<thead>
<tr>
<th>Pipeline Survey Type</th>
<th>Survey Definition</th>
<th>Events stored in</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pipeline Route Survey</strong></td>
<td>Proposed pipeline route corridor survey conducted before the actual installation used to identify the best route. The use of geophysical and geotechnical survey techniques are most common, in addition to video, still cameras and other environmental survey techniques.</td>
<td>SSDM The proposed pipeline route in PODS/APDM or in-house pipeline data model</td>
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<tr>
<td><strong>Pipeline Pre-lay Survey</strong></td>
<td>Pre-lay survey is conducted immediately before the actual installation. It uses visual techniques only along the actual route itself (i.e. not a corridor) to confirm that no changes have occurred since the original route survey. ROV sector scanning sonar (also called obstacle avoidance sonar) is often also used, but typically only recorded on video black box.</td>
<td>SSDM The proposed pipeline route in PODS/APDM or in-house pipeline data model</td>
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<td><strong>Pipeline As-Laid Survey</strong></td>
<td>The aim of the as-laid survey is to undertake a complete visual and instrumental ROV inspection along the pipeline as soon as the pipeline has been laid. The as-laid survey will define: the accurate position of the pipeline, the pipe-seabed configuration (visual and instrumental) and the external status of the pipe. The as-laid results will be used to confirm/finalise the design of post-lay intervention works.</td>
<td>PODS/APDM or in-house pipeline data model</td>
</tr>
<tr>
<td><strong>Pipeline As-Built Survey</strong></td>
<td>The aim of the as-built survey is to undertake a visual and instrumental ROV inspection of the post-lay intervention work such as trenching or rock cover areas just after their completion. The as-built survey will define the final status of the pipeline and of the post-lay intervention works.</td>
<td>PODS/APDM or in-house pipeline data model</td>
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<tr>
<td><strong>Acoustic Pipeline Inspections – using SSS and MBES</strong></td>
<td>The aim of an acoustic pipeline inspection is to record the current condition, position of the operated pipeline and the seabed conditions in the vicinity of the pipeline. Typical mapped results from this type of inspection are: outlines of structures, depressions and mounds, abrupt changes in slope, sunken objects, debris, cables, chains, piles, seabed material, sand ripples, dredges, pipeline free spans etc. The survey results are interpreted from SSS and MBES data. If the interpreted results intersect the pipeline centerline the data should be converted to online events and stored in pipeline data models. If the interpreted features (e.g. scours, debris) do not intersect the pipeline centerline, offline features should be stored in the SSDM.</td>
<td>PODS/APDM or in-house pipeline data model SSDM</td>
</tr>
<tr>
<td><strong>Visual Pipeline Inspection using ROV conveyed video cameras</strong></td>
<td>Typical mapped results from this type of inspection are: free spans, pipeline damage, debris, position and condition of anodes and cathodic protection, crossings, lateral movement, etc. The survey results reference the intersection of the specific event with the centerline and are typically reported by x,y,z and m station value. (Further discussed in Section 9).</td>
<td>PODS/APDM or in-house pipeline data model</td>
</tr>
<tr>
<td><strong>Internal Pipeline Inspection</strong></td>
<td>The aim of the internal pipeline inspection is to assess the internal condition of the pipeline through the use of inspection gauges or ‘pigs’ to measure pipe thickness and corrosion and other conditions along the pipeline.</td>
<td>PODS/APDM or in-house pipeline data model</td>
</tr>
</tbody>
</table>
Pipeline Route Survey Example
General Imaging Acoustic Survey Example
Interface

PIPELINE DATA MODEL

Report
Activity

ReportDocumentCrossRef
Relating an activity to a document

ExternalDocument
Not related to a specific activity

Via ReportCrossRef

Via DocumentCrossRef
Features related to documents without activities (source documents, images etc)

Report Metadata tables (via ReportEventID Field)
These tables provide additional information for different types of activities in the database
- Work Order
- Illinspection
- PhysicalInspection
- Maintenance
- SurveyKeySheet

All pipeline features
Any table or feature class in the database

Relate or Join via:
SURVEY_ID or SURVEY_ID_REF

SSDM

Survey_Keysheet

Relate or Join via:
SURVEY_ID or SURVEY_ID_REF

All SSDM Features
Questions?