
Earth Observation for Oil & Gas

Offshore Monitoring



StormGeo



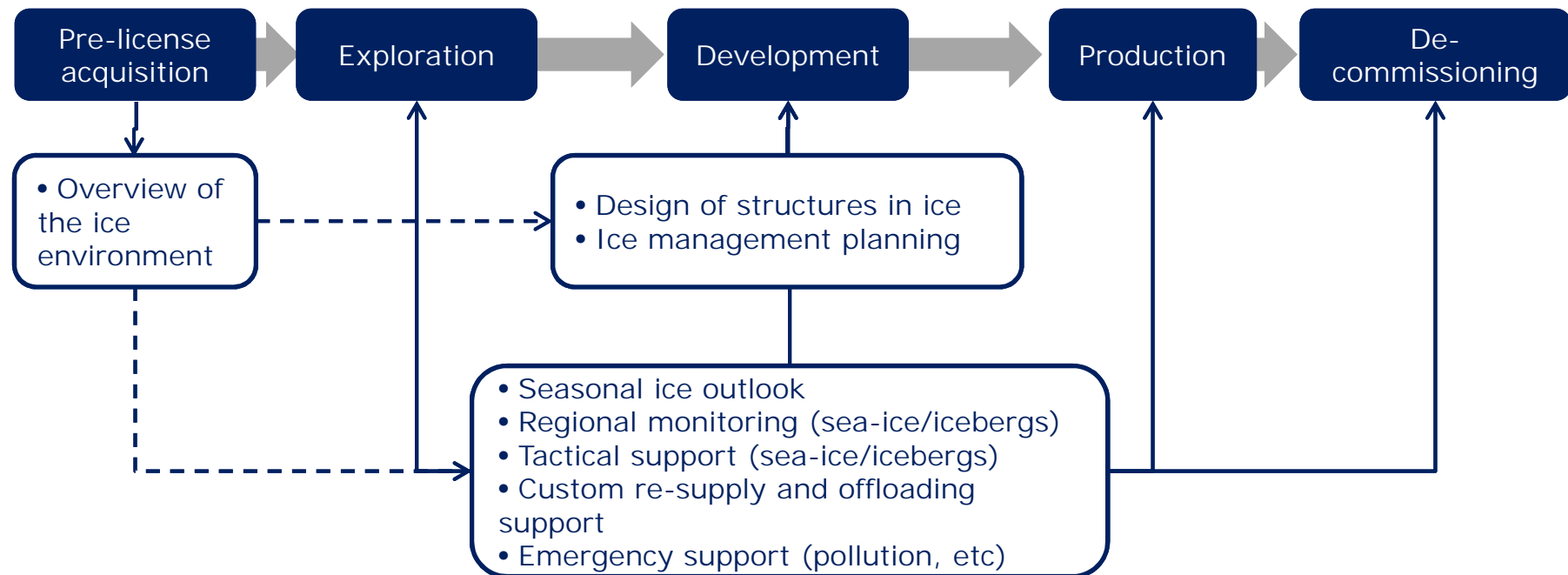
History - TransIce

- VAE project: pilot projects on ice charting for transportation, O&G
 - VTT, eOsphere, Polar Imaging Limited
- Pilots showed that many companies had similar problems
- No standards for products
- No guidance for EO-based information
- Lack of information with imagery providers on delivery needs

Proposal on Ice Charting Guidelines

- Team consisted of
 - Desmond Power
 - Kim Partington (PIL)
 - Walt Spring (on behalf of Shell)
- Phase A. Establish requirements and current practices for EO-based ice information in the O&G sector
 - Workshop with O&G Industry to validate requirements
 - May 2012-Jan 2013
- Phase B. Establish guidelines and standards for EO-based ice information in the O&G sector
 - Separate workshops for EO, O&G Industry
 - Scope approved by OGP Geomatics Committee, waiting on funding

Ice Information and the O&G Lifecycle



EARSC/ESA Workshop on a EO Product Certification Scheme

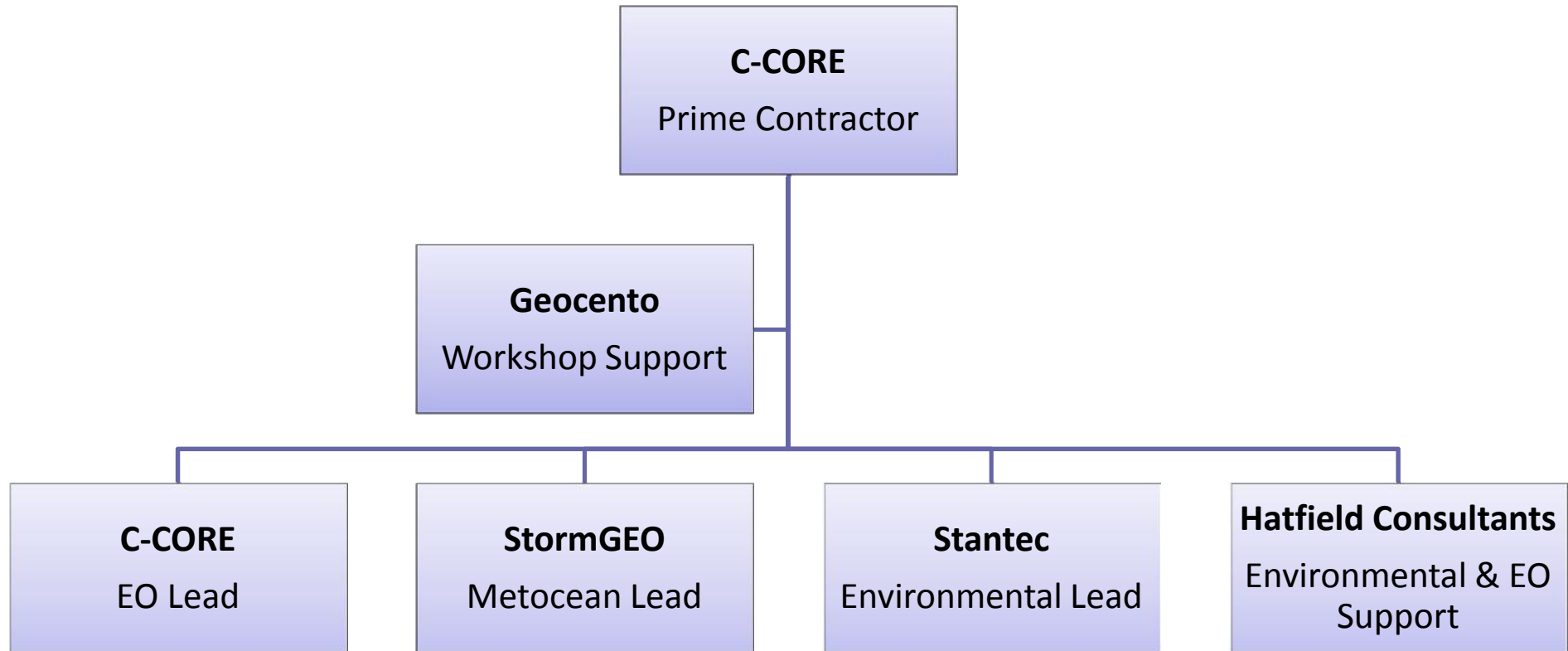
- Workshop April 15&16, 2013
- Focus on
 - O&G
 - Emergency and Insurance
 - Land applications
- Outcome: Document Requirements Definition for Earth Observation Product Specifications

Scope for EO for O&G

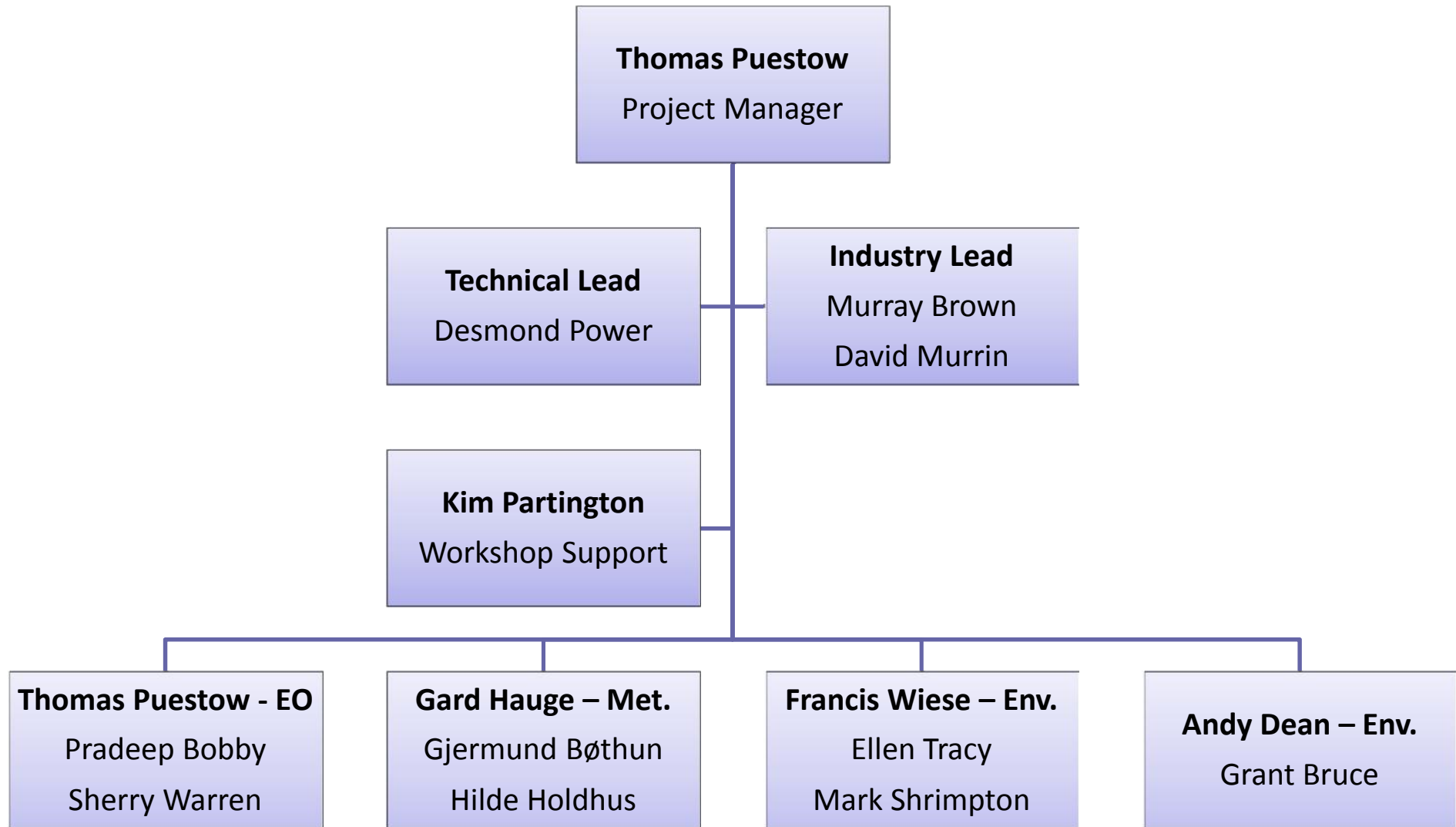
<u>Off-shore & Coastal</u>	Pre-license	Exploration	Developm.	Production	De-Com.
Metocean data mapping & monitoring	✓	✓	✓	✓	✓
Env. Monitoring (incl seepage)	✓	✓	✓	✓	✓

- Off Myanmar
- Eastern Mediterranean (Israel, Cyprus)
- West of Ireland
- Offshore Morocco
- South China Sea
- Falklands

Project Organizational Chart

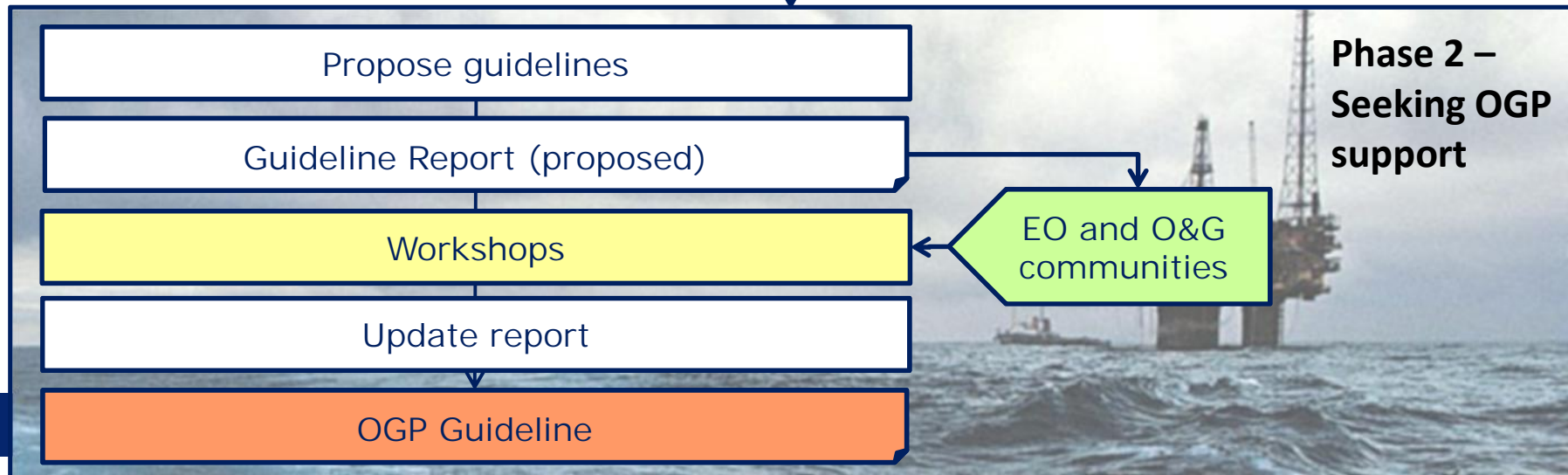
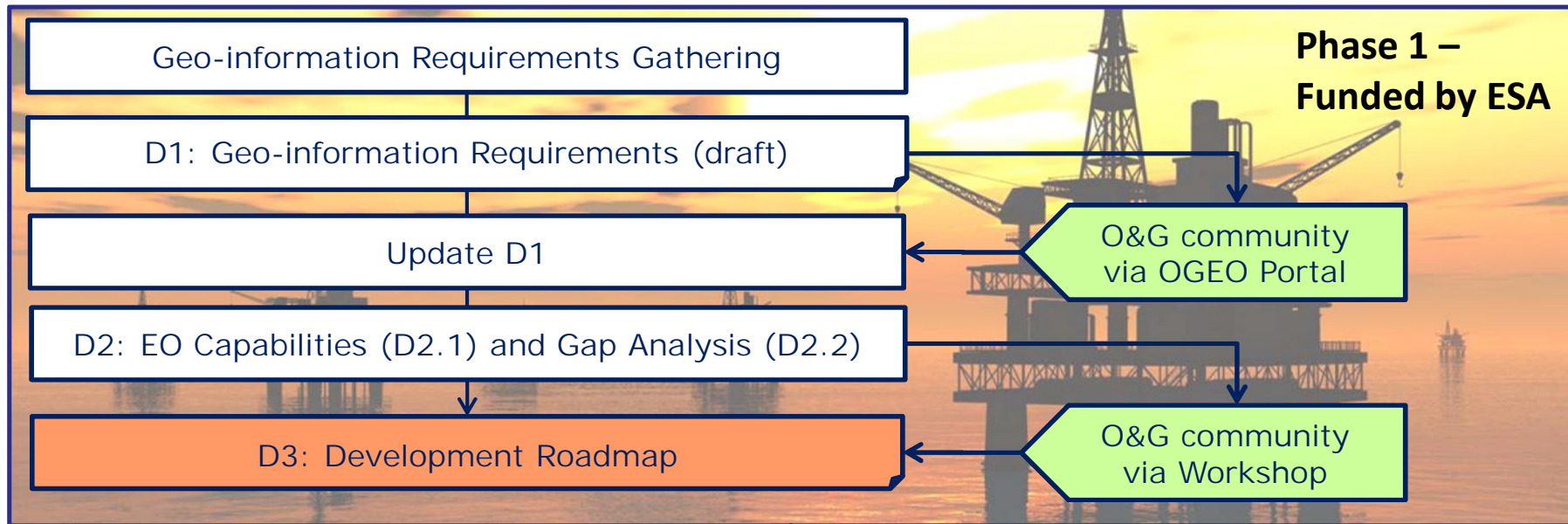


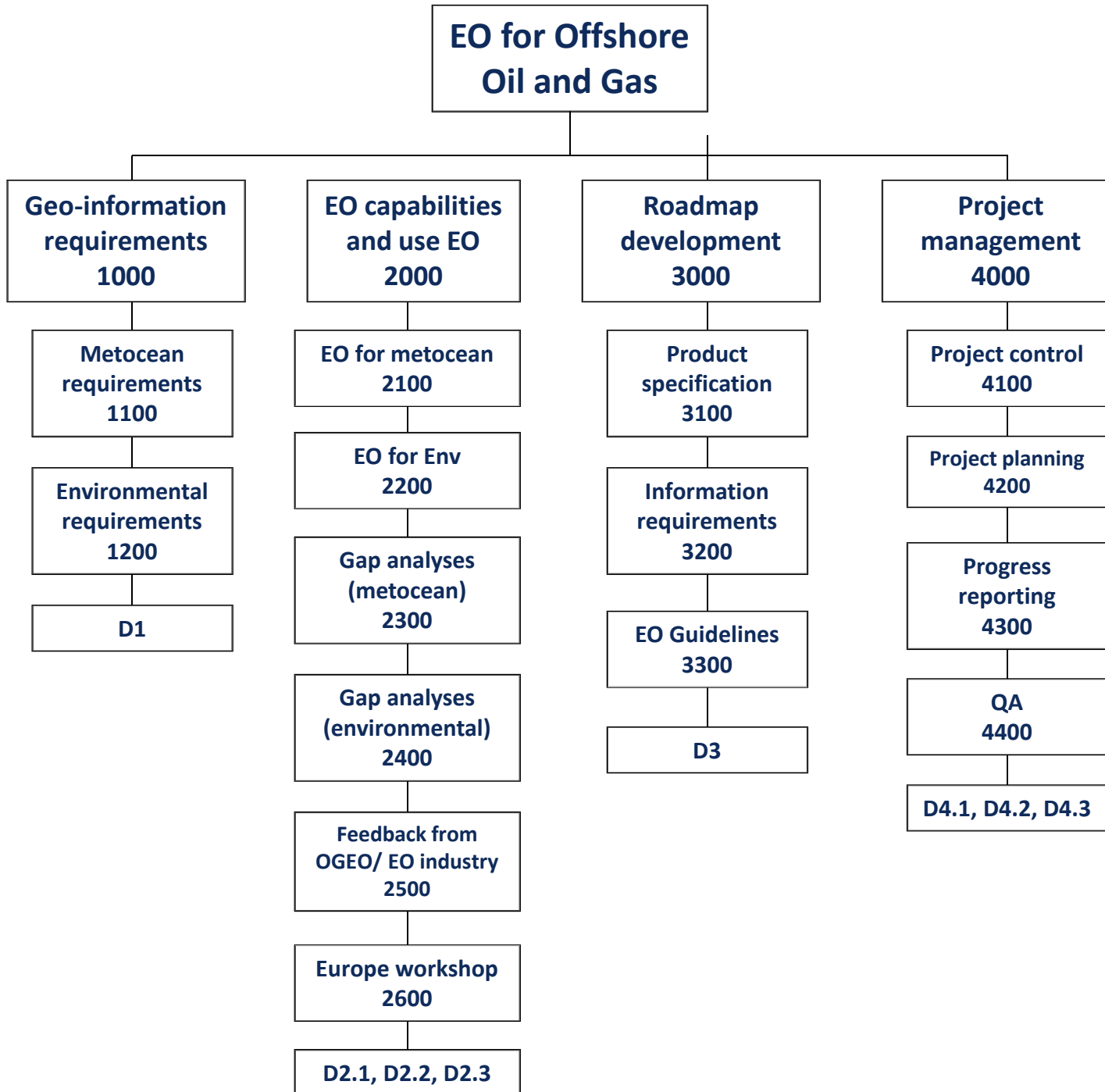
Project Organizational Chart



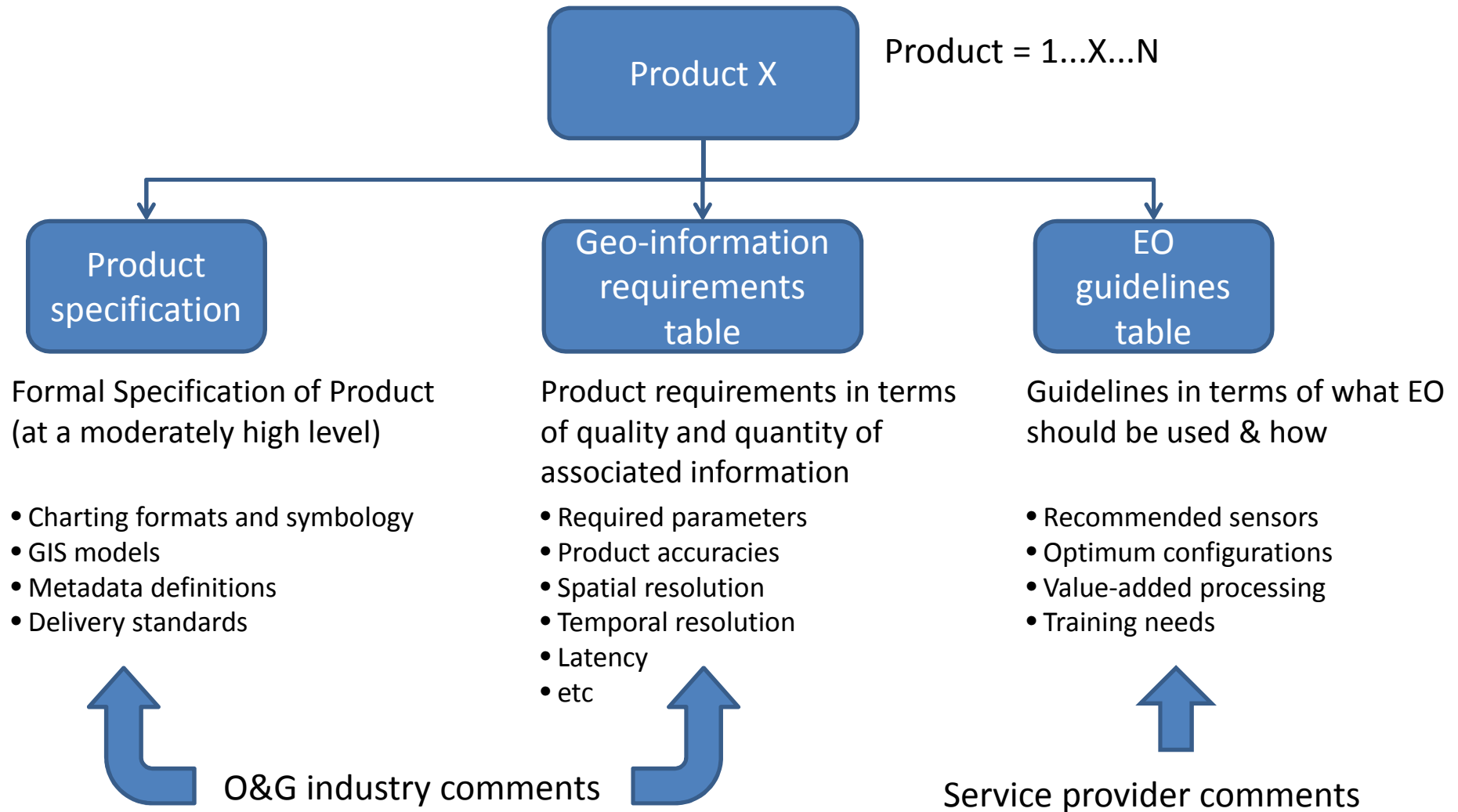
Project Scope

I identify Minimum Best Practices

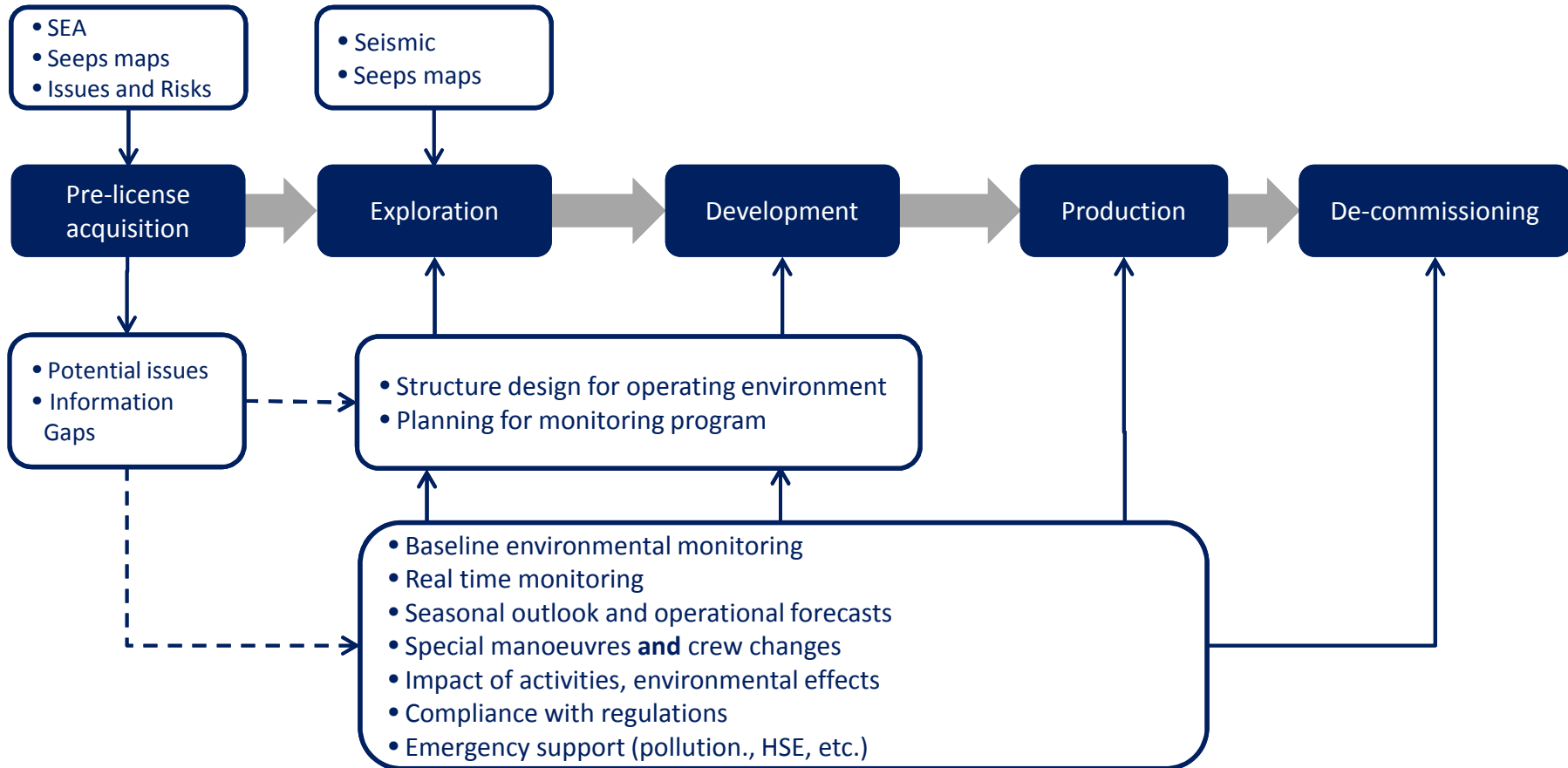




For each product: generate set of specification and guideline tables



Metocean/Environmental Information and the O&G Lifecycle



Geo-information table for environmental data

Location	Pre-license	Exploration						Development				Production				Decommission & Abandon
		2D/3D Seismic	CSEM	Geo-hazard	VSP	Drilling	Design	Construct	Install	Baseline	Initial	Satellite	ECM	EEM		
Off Myanmar																
Nearshore (very close, 1 m water depth)																
Offshore (250 km, 2,000 m water depth)																
Eastern Mediterranean																
Offshore Cyprus (15 to 50 km, 1,000 to 7,000 m water depth)																
Nearshore Israel (50 m water depth)																
Offshore Israel (100 km, 5,000 m water depth)																
West of Ireland																
Offshore (150 km, 1,500 m water depth)																
Offshore Morocco																
Offshore (350 km, 3,500 m water depth)																
South China Sea																
Falklands																

Geo-information table for metocean data

Geographic Region	Met-ocean data access	Rainy season	Depths (m)	Coastal	Tropical storms	Squalls	Long period swells	Heat and humidity	Frequent low visibility	Currents
Off Myanmar	Scarce	May-Oct	1-2000	×	x	×		×		
Eastern Mediterranean (Israel/Cyprus)	Basic	No	1-2000	×		×		×		
West of Ireland	Good	No	0-1500				×	×	×	×
Offshore Morocco	Scarce	No	100-3500	×?			×	×	×	×
South China Sea										
Falklands										

Geo-information requirements template

ID	OFF-CC-xxx
Title	Wind Information (max 4 words)
Description of use in oil and gas operations	Free text
Thematic Information content	<ul style="list-style-type: none">• Wind speed (m/s)• Wind direction (degrees)
Geographic context/restrictions	West of Ireland, global etc
O&G lifecycle context	Exploration
Geometric Accuracy	1 pixel
Update frequency	Daily, weekly, annual etc
Spatial resolution	1m, 100m, 1 km etc
Seasonal variations	September – April, all year etc
Delivery format?	
Candidate EO products	Altimeter wind products SAR based wind products etc

A guideline has clear benefits to industry

- Clear charting options available to industry
 - Recommended ice information products for each stage of the O&G lifecycle
 - Product formats (charts)/GIS Model defined
 - Guidelines for accuracies of ice parameters
 - Guidance on recommended sensors/satellites
- Information content is documented & based on capabilities of existing satellites
 - Documents EO state of the art
 - Training modules defined for products
 - Ability to leverage experience from across the industry
- Processes exist for guideline to adapt to increasing EO capabilities
 - Satellite industry has a long term outlook for launches
 - Future capabilities can be included

A guideline has clear benefits to industry

- Companies can build processes and systems around guideline
 - Industry/service providers can build systems around GIS Models
- Companies assured that service providers who adhere to the guideline will be compatible with their systems
 - RFPs can be issued with charting guidelines and GIS models
- Knowledge of EO capabilities are not lost with staff turn-over
 - Emphasis on training can ensure future generations of employees know the state of the art
- Increased access of the market to a wider variety of service providers
- Increased uptake, increased competition (new companies will have level playing field), lower costs (as more companies offer services)