



New Mexican Regulatory Regime for Deepwater Development

24 February 2020

Near Miss: Feet smashed by heavy chain link



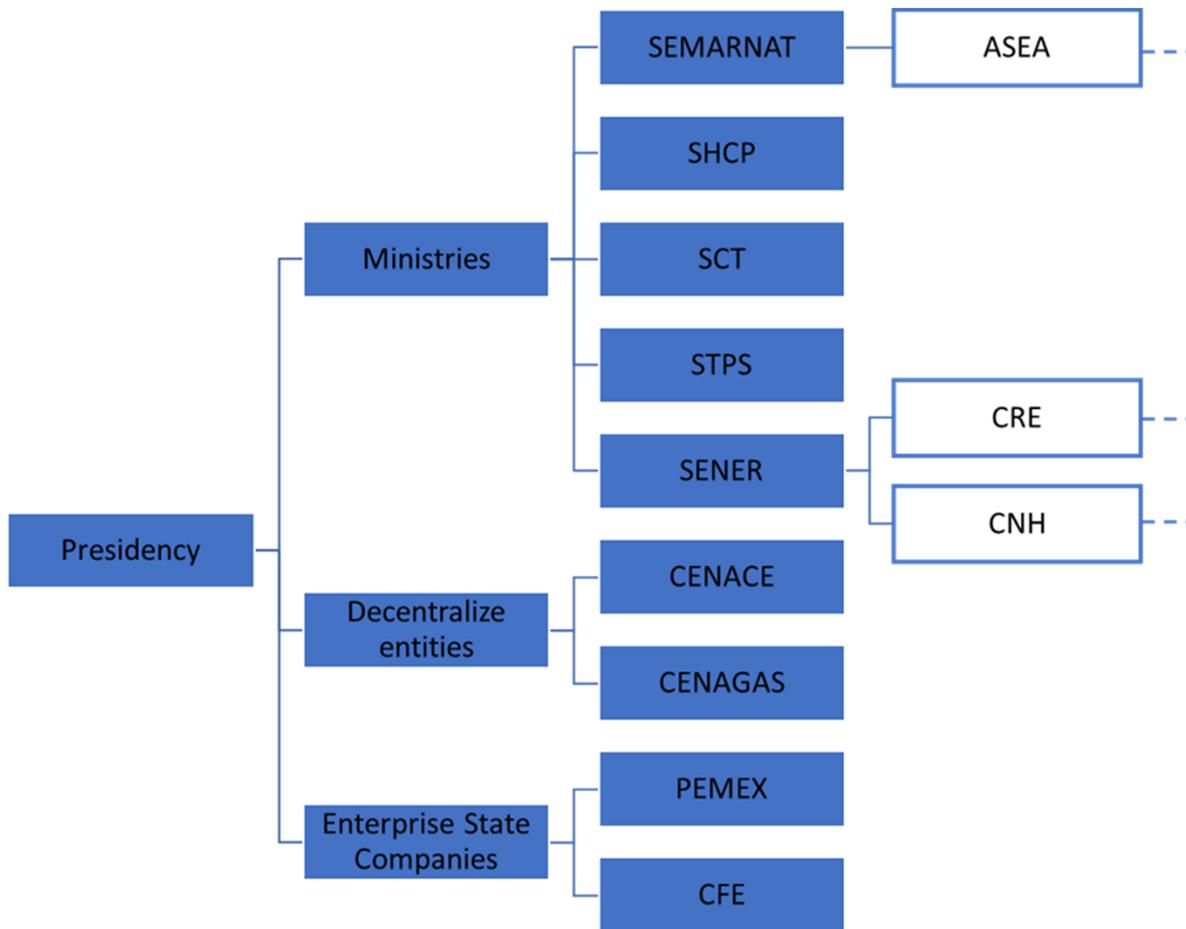
What happened?

Our surveyor was checking the traceability marks of a chain link, which was in an unstable position. The link was vertically positioned and while squatting beside the link checking the marks, the link moved and fell. Fortunately, the surveyor managed to jump backwards, and the link did not fall on his feet. The weight of one of these links is 393 kg.

Agenda

- 9:00-9:30 Overview of regulatory setup, various regulatory agencies & jurisdiction
- 9:30-10:00 Permitting process and timeline For Drilling Phase
- 10:00-10:45 Permitting process & Technical requirements for Production Facilities
- 10:45 -11:00 Break
- 11:00 -11:30 Regulatory Requirements for Subsea Wells and Pipeline
- 11:30-12:00 Open discussion: Challenges & Risks
- 12:00- 13:00 Lunch
- 13:00–14:00 Introduction of Canadian Regulation for Offshore Facilities
- 14:00 – 14:45 Introduction of Brazilian Regulation for Offshore Facilities
- 14:45 - 15:00 Break
- 15:00 -15:45 DNV GL Insight on NR-37
- 15:45-16:00 Q&A and Summary

Mexican Regulatory Institutions After Energy Reform



PEMEX – National Oil Company
CFE – Enterprise State Company for Power, Transmission and Electrical Distribution
CRE – Energy Regulatory Commission
CNH – Regulatory for Hydrocarbon E&P
ASEA – Regulator for HSE

SEMARNAT – Ministry of Environment
SHCP – Ministry of Finances and Taxes
SCT – Ministry of Transportation
STPS – Ministry of Labour
SENER – Ministry of Energy
CENACE – Energy Control Center
CENAGAS – Natural Gas Regulatory

Jurisdiction of Regulatory Agencies

	CNH	ASEA	STPS	SCT
Well drilling	✓	✓		
Well integrity	✓	✓		
Natural gas venting and flaring requirements	✓	✓		
Personnel safety		✓	✓	
Transportation		✓		✓

ASEA IS THE LEADING REGULATOR FOR O&G SECTOR w.r.t. SAFETY & ENVIRONMENTAL PROTECTION

ASEA's Proposed Risk Management Model



A blend of Goal-based & Prescriptive Regime

Jurisdiction of Regulatory Agencies (Cont'd)



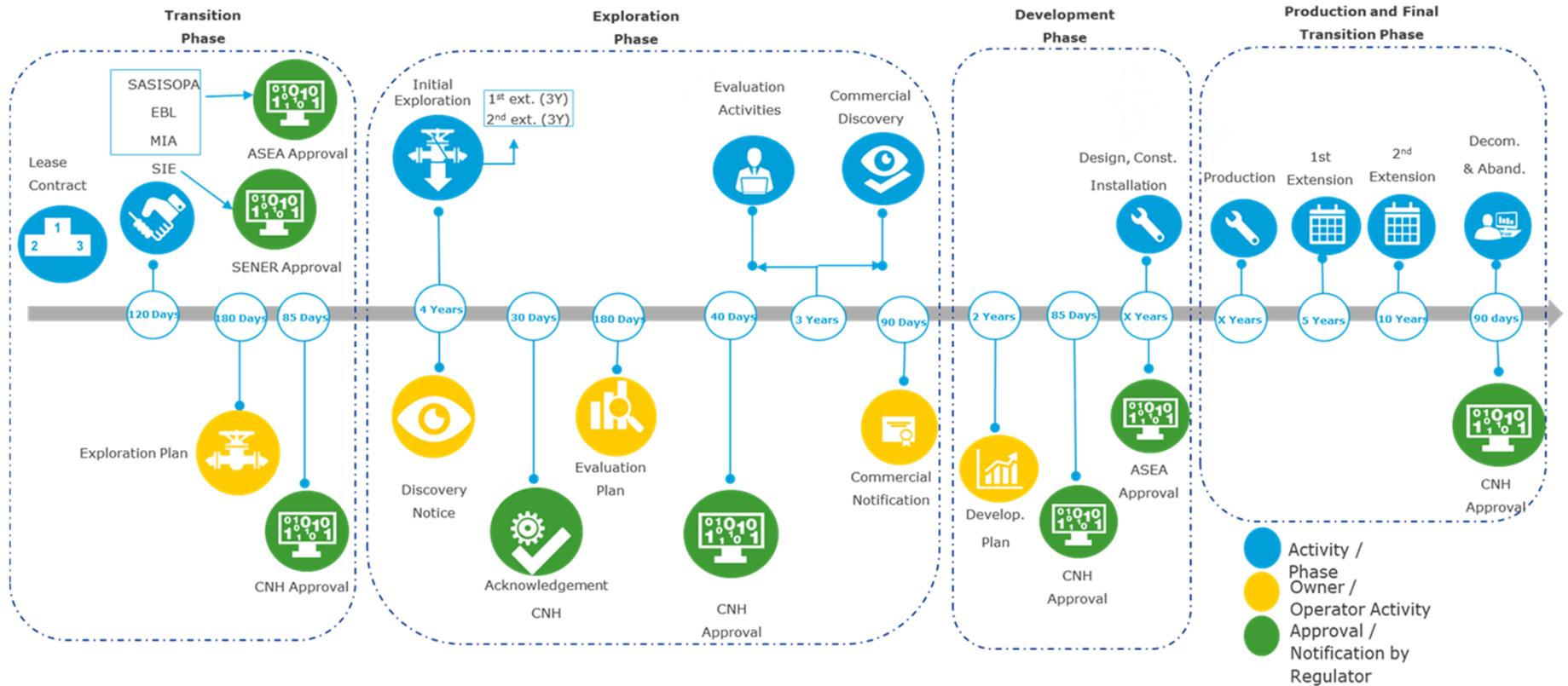
	Upstream		Midstream		Downstream	Retail
	Onshore	Offshore	Onshore	Offshore		
ASEA						
BSEE (USA)						
BOEM (USA)						
AER (Canada)						
HSE (UK)						
AMLA (Col.)						
PSA (Norway)						

Industrial safety Environmental Protection

7

Note: This was presented by ASEA during a public conference in Mexico in 2017. It should be noted that the representation of regulators in other countries as shown in the figure may not be complete and accurate.

Permitting and Approval Process



Permitting process and timeline For Drilling Phase

Steps for obtaining drilling authorization

Sener

- Social Impact Evaluation

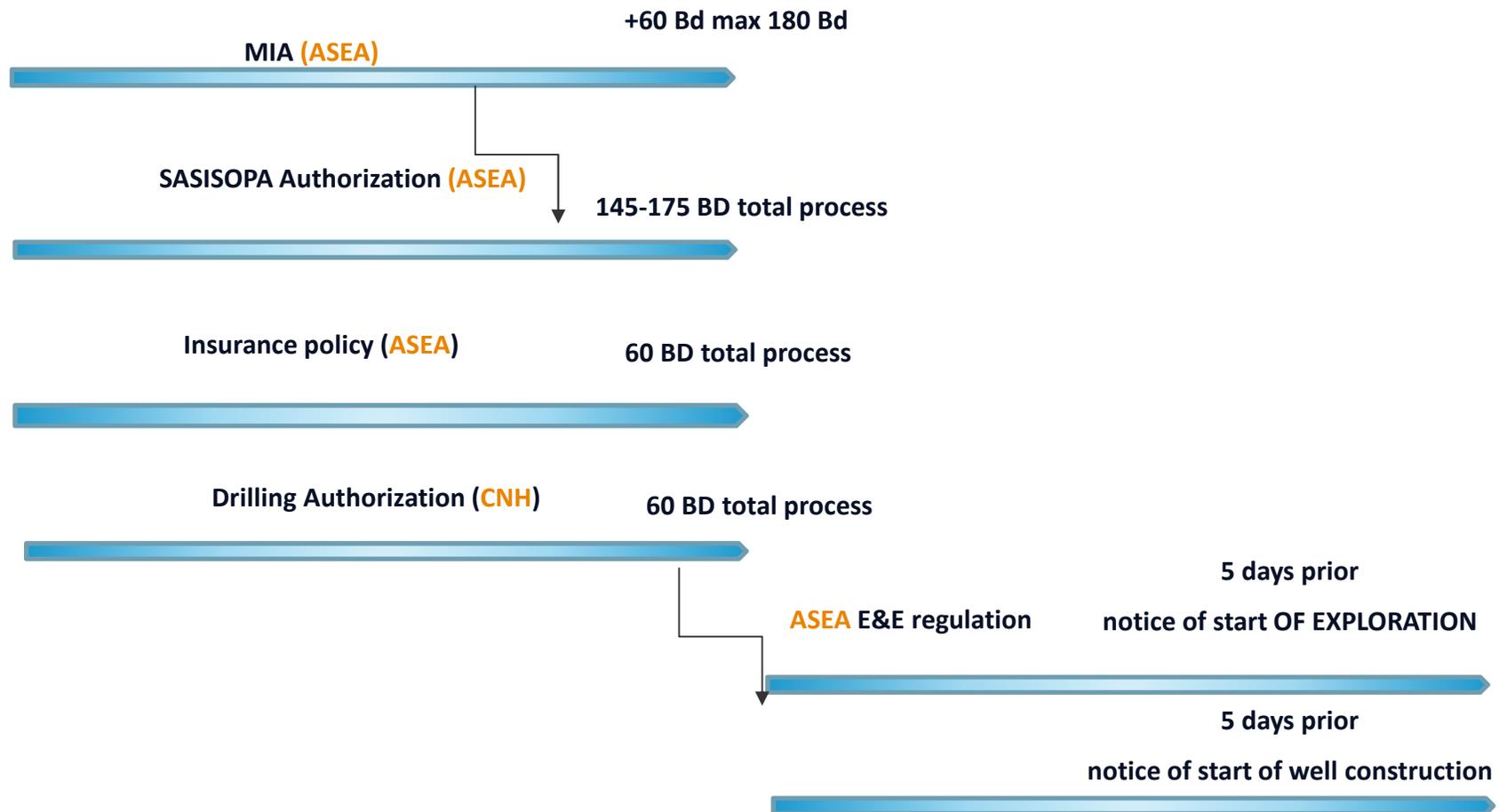
CNH

- Drilling authorizaton

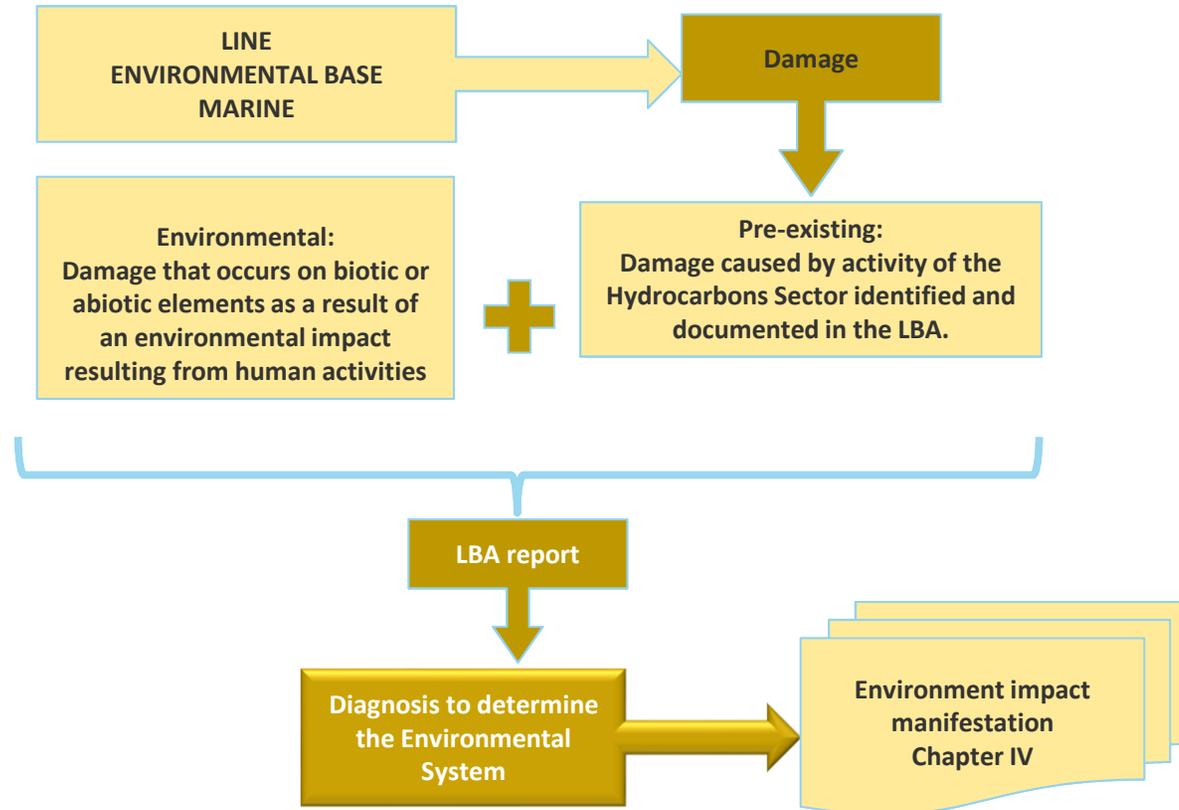
ASEA

- *SASISOPA*
- *Environmental Base Line (LBA)*
- *Environment Impact Assessment (MIA)*
- *Insurance and Financial Guarantees*
- *Notice of Start*

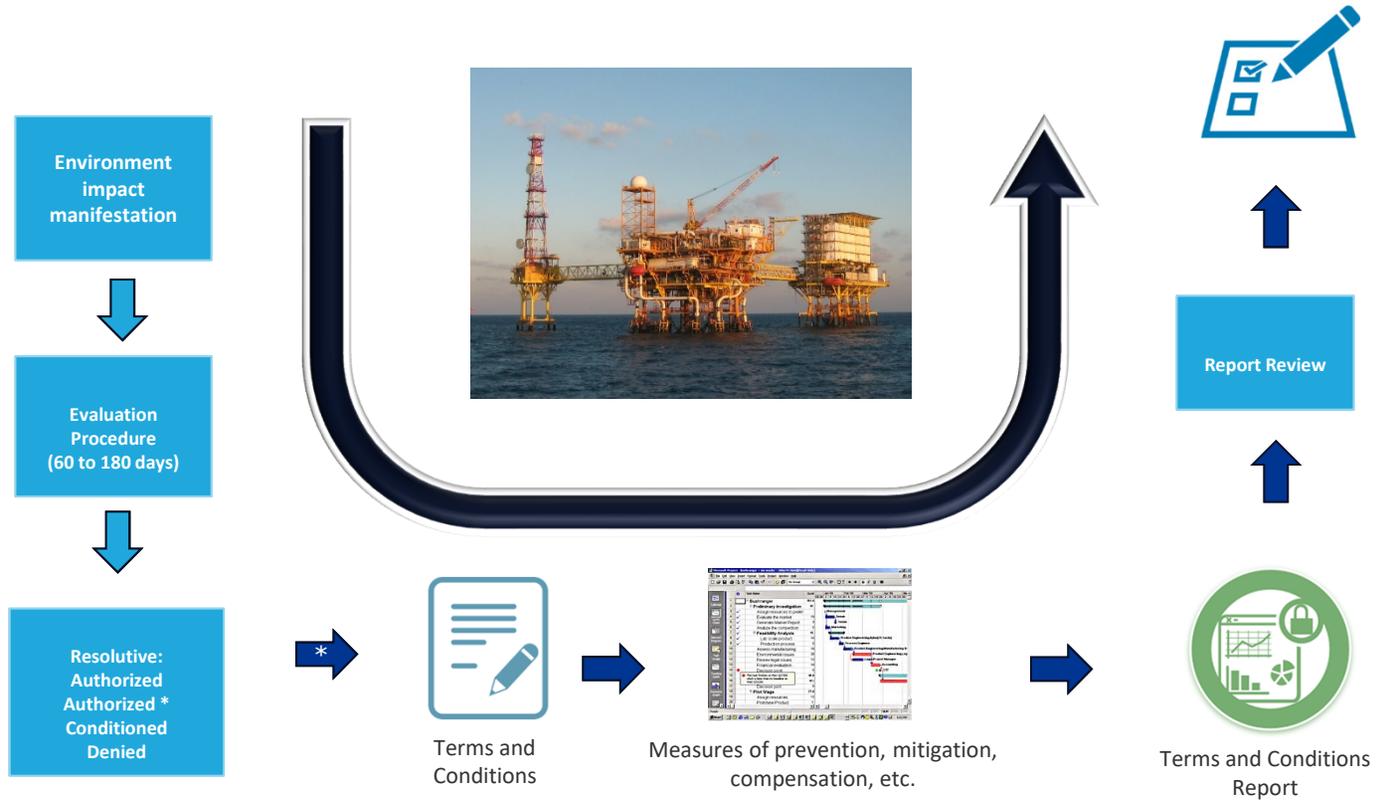
Overall Timelines Before 1st Well



Environmental baseline



MIA (Evaluation Process)

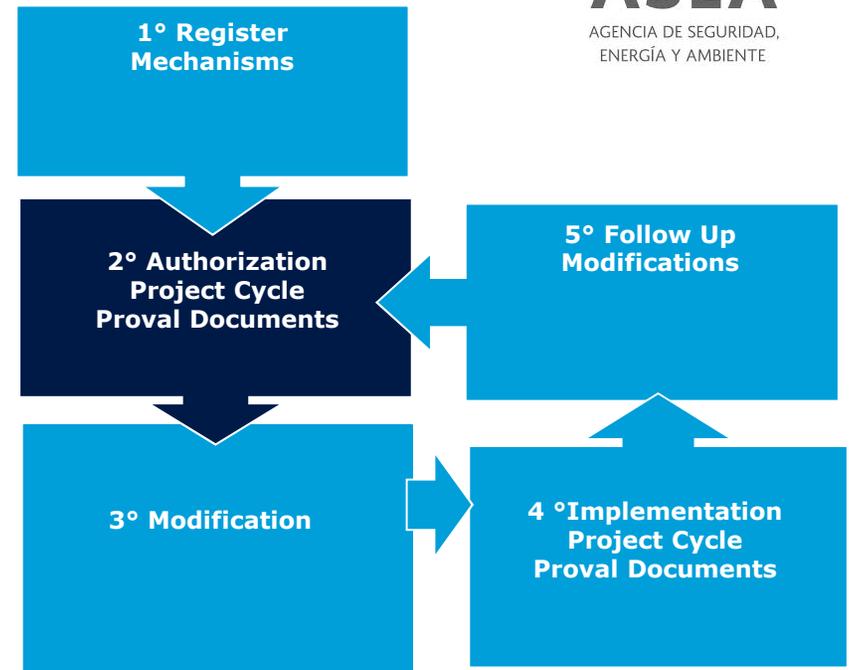


SASISOPA



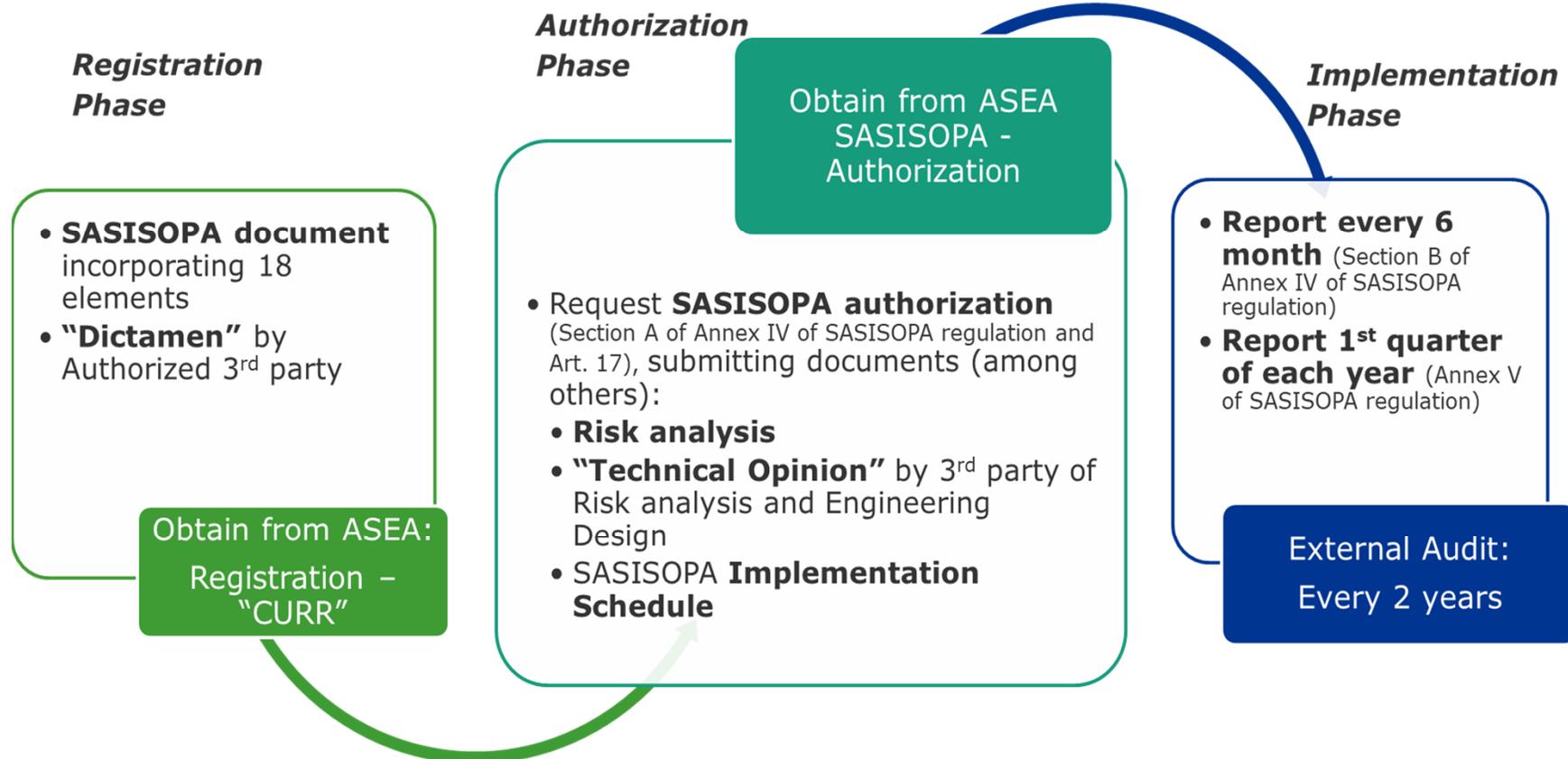
GENERAL administrative provisions that establish the regulation for the formation, implementation and authorization of the Systems of Administration of Industrial Safety, Safety and Protection to the Environment applicable to the activities of the Operational Hydrocarbons Sector indicated. (SASISOPA)

Requirement	Title	Requirement	Title
I	SEMS Policy	X	Change management, startups, and activities control.
II	Danger identification and risk analysis.	XI	Mechanical integrity and quality assurance.
III	Legal requirements.	XII	Contractors' safety
IV	Goals, objectives and indicators.	XIII	Emergency preparedness and response.
V	Roles, responsibilities and authority.	XIV	Monitoring, verification and evaluation.
VI	Competence, training and coaching.	XV	Audits.
VII	Internal communication, participation and consultation.	XVI	Incidents and accidents investigation.
VIII	Document's control and registries.	XVII	Results' review.
IX	Best practices and standards.	XVIII	Performance reports.



SASISOPA Life Cycle

SASISOPA Initial Setup and Implementation



ASEA E&E regulation: Notice of Start

- Start notices as per E&E regulation
 - Art. 27 The Notice of Initiation of **Surface Recognition and Exploration activities**, at least **five business days** before beginning its operations, in accordance with the FF-ASEA-038 format;
 - Article 60 BIS. The Regulators must submit to the Agency in physical or electronic form, the Notice of Start of installation of **fixed platform for Extraction**, at **least ten business days** prior to the start of the installation, in accordance with the format FF-ASEA-038;
 - Article 78 BIS. For **the Construction of Wells**, the Regulators must submit to the Agency in physical or electronic form:
 - I. The Notice of Beginning of the Construction of Well, at **least five business days** prior to the beginning of the **Construction of Well**, in accordance with the format FF-ASEA-038;
 - Exploratory and production Deepwater and ultradeep water wells
 - Well type
 - Work over well notice

- **DNV GL is an authorized third party by ASEA**

ASEA, Insurance policy

- **Civil liability (Third parties)**

- Its purpose is to cover the damages and losses caused by the regulated to third parties that have no direct relationship with the works or activities of the hydrocarbons sector

- **Environmental liability per environmental damages**

- Its purpose is to cover the damages and losses caused by those regulated to the environment. The objective of this insurance is to cover the remediation of the contaminated site that has been made by the regulated company or the compensation in irreparable case

- **Insurance for the well control**

- Its purpose is to cover the regulated inefficient costs to control a well that has become out of control. The well must be in the ratio of insured goods

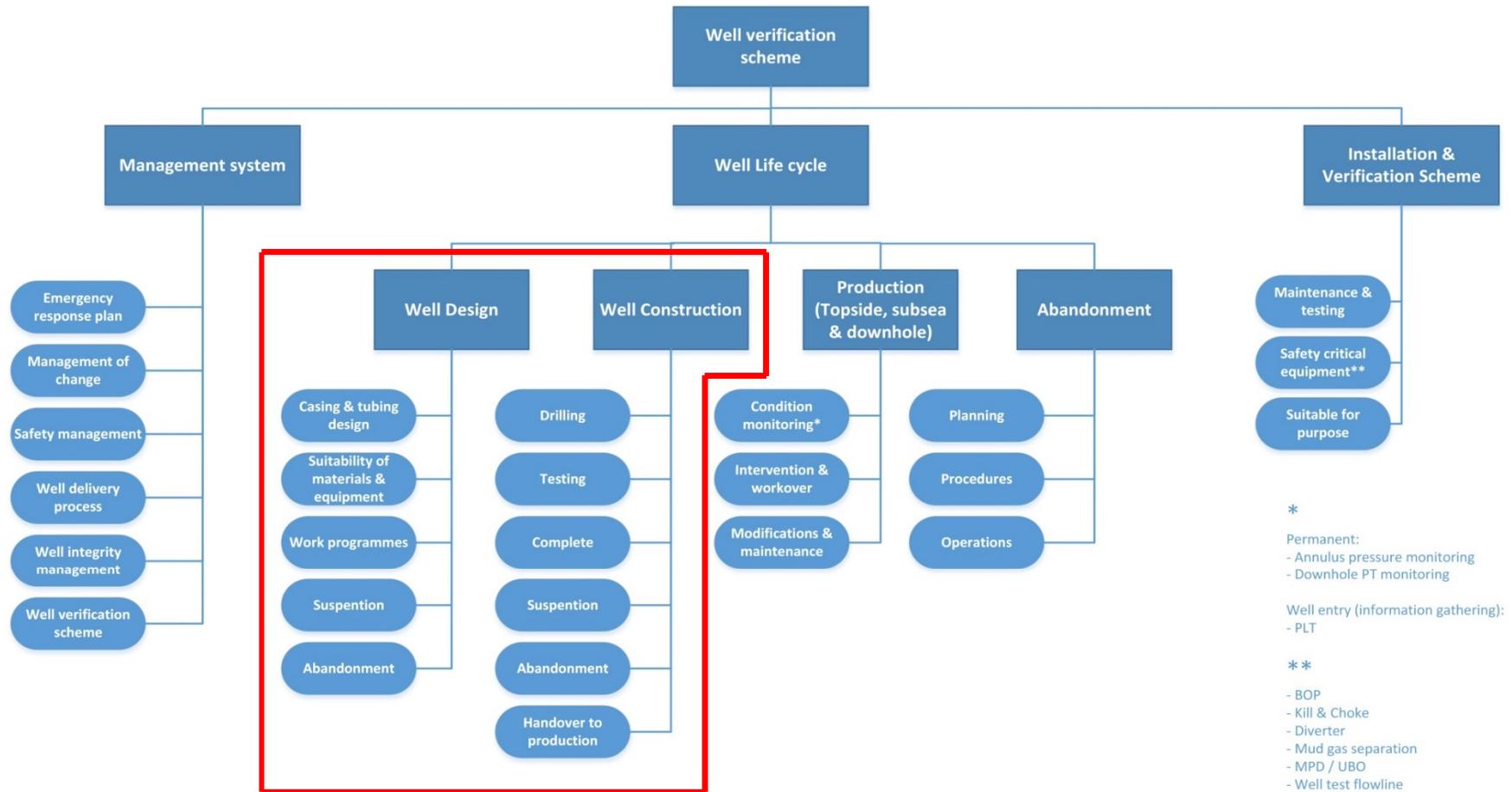
Drilling Permit By CNH

- Drilling well regulation (CNH)
 - Article 27. Of the general requirements that the Perforation Authorization request must contain. The Oil Operator must present his authorization request, along with the proof of payment of the respective rights or uses and the formats for the request of Authorization of Wells, APT-1; of the Request for Administrative Record of Well, RAP-1, and for the report of performance and compliance indicators related to the Well Drilling Authorization, IDC-1.

21 requirements to request the drilling permit

- Prior to grant drilling permit for deep waters;
- Art. 28...Operator shall submit a Certificate issued by an Independent **Third Party certifying that the proposed Design is suitable for geological and geophysical objectives and conditions**, and that Best Practices have been adopted.

DNV GL – Well verification scheme



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Permanent:
- Annulus pressure monitoring
- Downhole PT monitoring

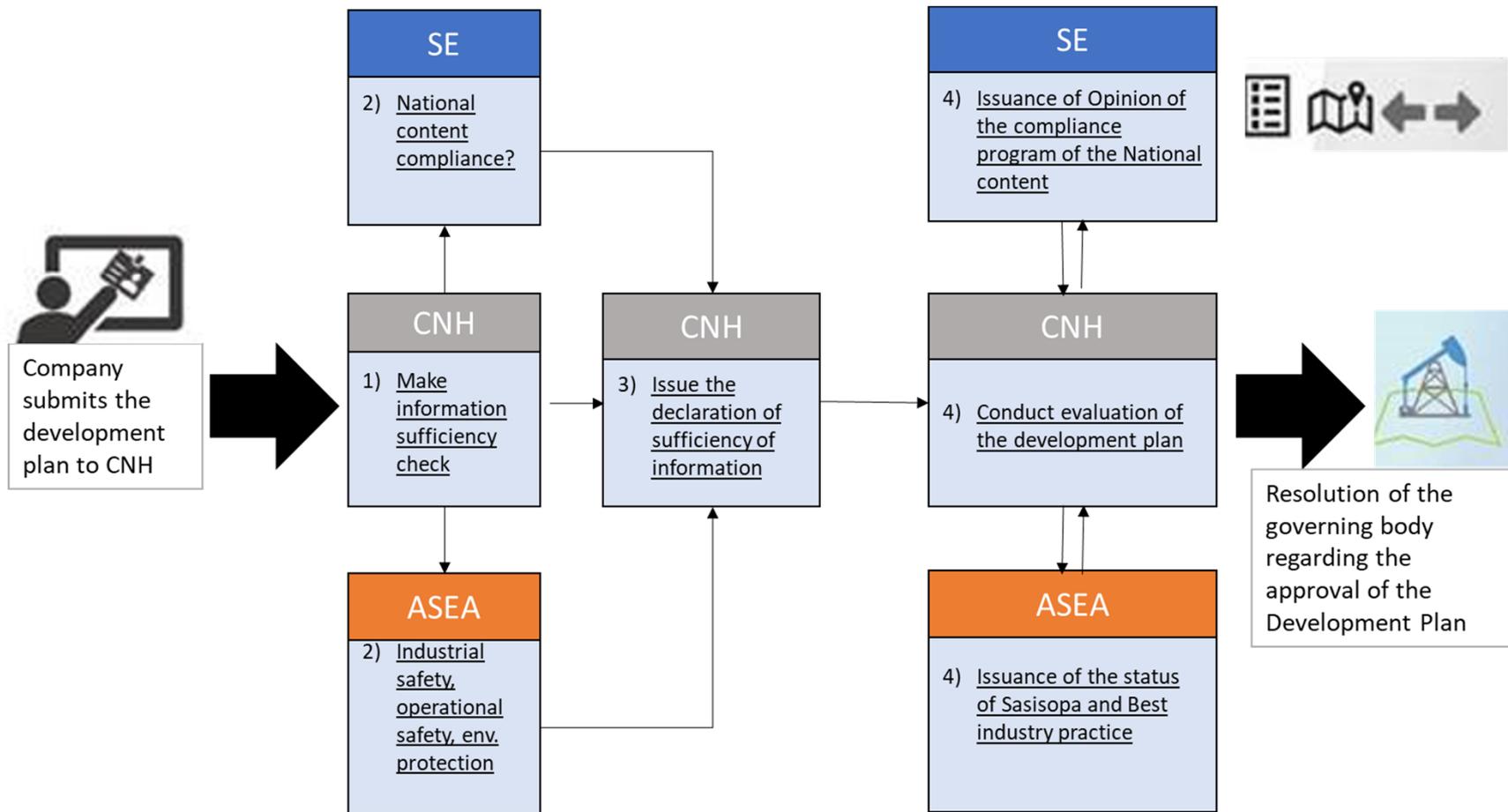
Well entry (information gathering):
- PLT

**
- BOP
- Kill & Choke
- Diverter
- Mud gas separation
- MPD / UBO
- Well test flowline

BOP Blowout preventer
MPD Managed Pressure Drilling
UBO Underbalanced operation
PT Pressure & Temperature
PLT Production Logging Tool

Permitting Process and Technical Requirements for Production Facilities

Approval of Development Plan



Main Regulations Relevant to Floating Production Facility

ASEA E&E Regulation: "Regulation for Industrial Safety, Operational Safety and protection of the environment to perform the activities of Geophysical Survey and Exploration, **Exploration and Extraction** of Hydrocarbons", 2019.

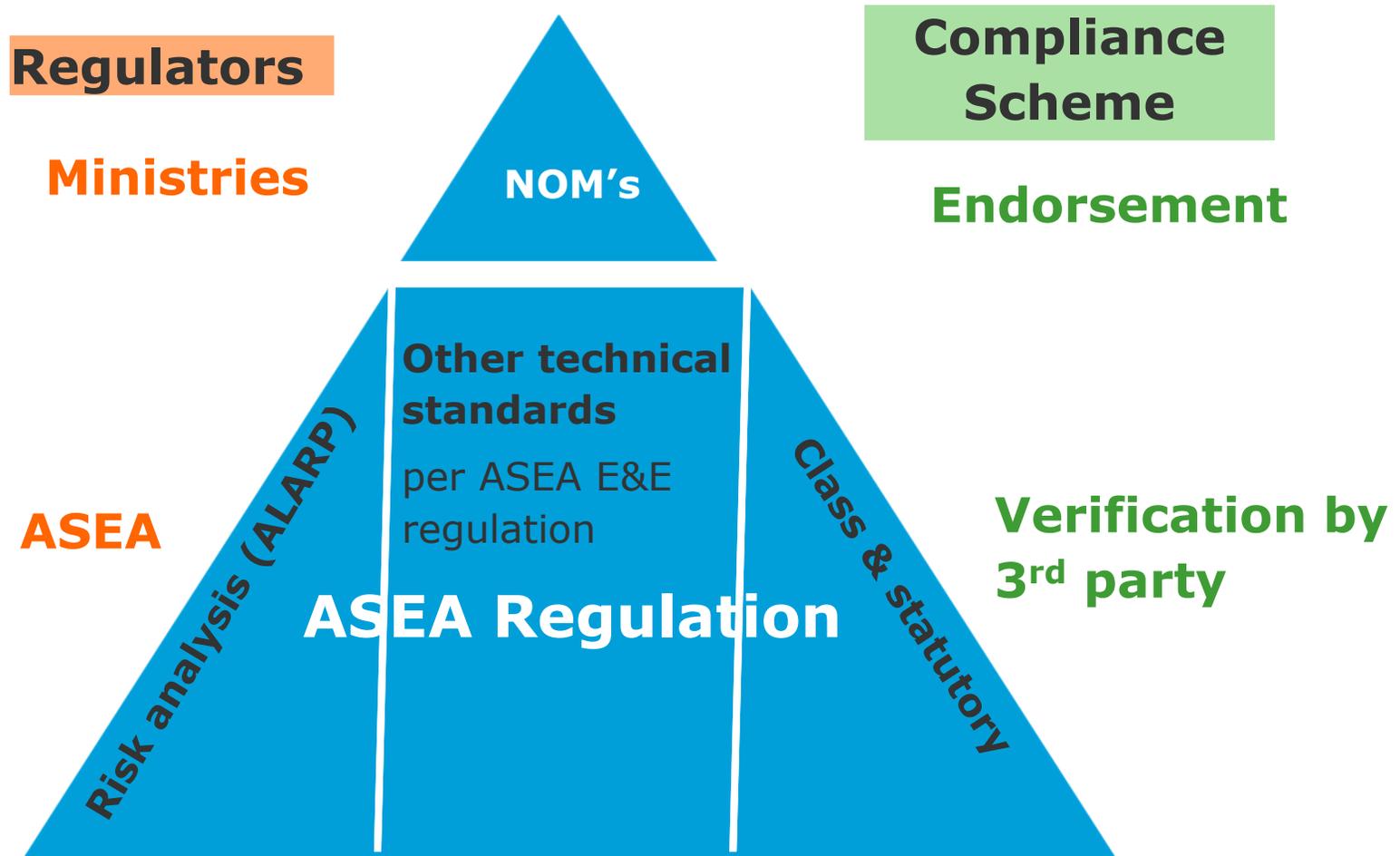
ASEA Offloading Regulation: "Regulation for the design, construction, pre-commissioning, operation, maintenance, closure, dismantling and abandonment offloading facilities associated to transportation and distribution activities for hydrocarbons, by means other than pipelines, 2019

ASEA Methane Emission Control Regulation, *"Regulation for the Prevention and Comprehensive Control of Methane Emissions from the Hydrocarbons Sector"*

CNH Associated Natural Gas Utilization Regulation, "Regulation for the use of associated natural gas during exploration and extraction of hydrocarbons", 2016.

CNH Metering Regulation, "Regulation for Hydrocarbons Metering of Exploration and Extraction Activities", 2017

ASEA E&E Regulation for Floating Production Facility



ASEA E&E Regulation is the PRIMARY Regulation!

Verification of Risk Studies & ALARP Demonstration

ASEA E&E Required Risk Analysis

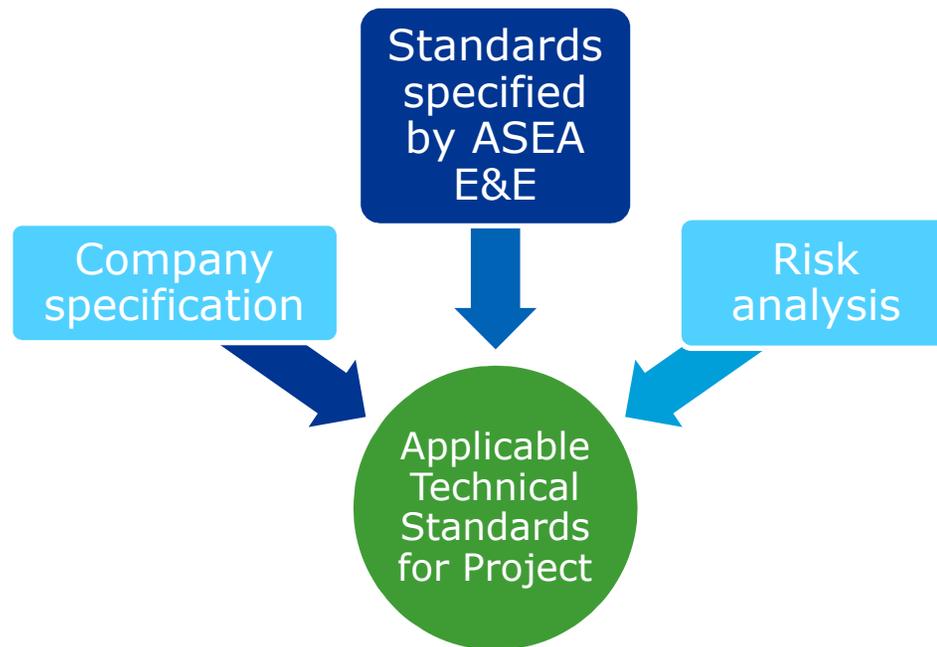
- HAZID.- a technique for identifying all the significant Hazards associated with a particular activity (Hazard Identification)
- PHA - Preliminary Hazard Analysis
- JHA - Job Hazard Analysis
- FTA - Fault Tree Analysis
- ETA - Event Tree Analysis
- HAZOP - Hazard And Operability Analysis
- FMEA - Failure Modes and Effects Analysis
- PEM - Physical Effects Modeling
- EERA - Escape, Evacuation and Rescue Analysis
- ENVID - Environmental Impact Identification



ALARP DEMONSTRATION

(prevention, detection, control, mitigation & emergency response)

Technical Requirements by ASEA E&E Regulation



- All technical standards listed are mandatory
- Alternative standards require technical justification "equivalent or better"
- Class is required for FPSO
- Class scope is not defined
- ALARP demonstration
- Document Evidence for compliance

Technical Standards Required by ASEA E&E Regulation - Examples

13	API RP 14C	Analysis, Design, Installation, and Testing of Safety Systems for Offshore Production Facilities Eighth edition, May 2018
14	API RP 14G	Recommended Practice for Fire Prevention and Control on Fixed Open-type Offshore Production Platforms Fourth Edition, April 2007.
15	API RP 14H	Recommended Practice for Installation, Maintenance and Repair of Surface Safety Valves and Underwater Safety Valves Offshore, Fifth Edition, August 2007.
16	API RP 14J	Recommended Practice for Design and Hazards Analysis for Offshore Production Facilities Second Edition, May 2001.
17	API RP 2A-WSD	Planning, Designing, and Constructing Fixed Offshore Platforms-Working Stress Design Twenty Second, Edition, November 2014.
18	API RP 2SIM	Structural Integrity Management of Fixed Offshore Structures First Edition, November 2014.
19	API RP 2MOP	Petroleum and natural gas industries - Specific requirements for offshore structures, Part 6- Marine operations First Edition, July 2010.
20	ISO 19900	Petroleum and natural gas industries - General requirements for offshore structures, Second Edition, December 2013.
21	ISO 19901-1	Petroleum and natural gas industries - Specific requirements for offshore structures - Part 1: Metocean design and operational considerations, Second Edition, October 2015.
22	ISO 19901-2	Petroleum and natural gas industries - Specific requirements for offshore structures - Part 2: Seismic design procedures and criteria, Second Edition, November 2017.
23	ISO 19901-3	Petroleum and natural gas industries - Specific requirements for offshore structures - Part 3: Topsides structure, Second Edition, January 2015.
24	ISO 19901-4	Petroleum and natural gas industries - Specific requirements for offshore structures - Part 4: Geotechnical and foundation design considerations, Second Edition, July 2017.
25	ISO 19901-5	Petroleum and natural gas industries - Specific requirements for offshore structures - Part 5: Weight control during engineering and construction, Second Edition, February 2016.
26	ISO 19901-6	Petroleum and natural gas industries - Specific requirements for offshore structures - Part 6: Marine operations, First Edition, December 2016.
27	ISO 19901-7	Petroleum and natural gas industries - Specific requirements for offshore structures - Part 7: Stationkeeping systems for floating offshore structures and mobile offshore units, Second Edition, May 2013.
28	ISO 19901-8	Petroleum and natural gas industries - Specific requirements for offshore structures - Part 8: Marine soil investigations, First Edition, December 2014.

Screening of Applicable NOM's - Examples

<u>NOM-001-SEMARNAT-1996</u>	PERMISSIBLE MAXIMUM LIMITS OF CONTAMINANTS IN WASTEWATER DISCHARGES IN WATER AND NATIONAL ASSETS.
<u>NOM-008-CONAGUA-1998</u>	SHOWER FACILITIES USED IN THE BODY TOILET-SPECIFICATIONS AND TEST METHODS.
<u>NOM-009-CONAGUA-2001</u>	TOILETS FOR SANITARY USE-SPECIFICATIONS AND TEST METHODS.
<u>NOM-010-CONAGUA-2000</u>	ADMISSION VALVE AND DISCHARGE VALVE FOR TOILET TANK-SPECIFICATIONS AND TEST METHODS.
<u>NOM-052-SEMARNAT-2005</u>	CHARACTERISTICS & PROCEDURES FOR IDENTIFICATION, CLASSIFICATION AND LISTINGS OF HAZARDOUS WASTE.
<u>NOM-053-SEMARNAT-1993</u>	PROCEDURE TO CARRY OUT THE EXTRACTION TEST TO DETERMINE THE COMPOSITION OF HAZARDOUS WASTE DUE TO ITS TOXICITY TO THE ENVIRONMENT.

<u>NOM-001-STPS-2008</u>	BUILDINGS, PREMISES, FACILITIES AND AREAS IN THE WORK CENTERS-SAFETY CONDITIONS.
<u>NOM-002-STPS-2010</u>	CONDITIONS OF SAFETY-PREVENTION AND PROTECTION AGAINST FIRES AT WORK CENTERS.
<u>NOM-004-STPS-1999</u>	PROTECTION SYSTEMS AND SAFETY DEVICES IN THE MACHINERY AND EQUIPMENT THAT IS USED IN THE WORK CENTERS. (WITH THE ENTRY INTO FORCE OF THE PRESENT NORMA, THE FOLLOWING MEXICAN OFFICIAL RULES ARE CANCELED: NOM-107-STPS-1994, NOM-108-STPS-1
<u>NOM-005-STPS-1998</u>	CONDITIONS OF SAFETY AND HYGIENE IN THE WORK CENTERS FOR THE HANDLING, TRANSPORTATION AND STORAGE OF DANGEROUS CHEMICAL SUBSTANCES.
<u>NOM-006-STPS-2014</u>	HANDLING AND STORAGE OF MATERIALS-SAFETY AND HEALTH CONDITIONS AT WORK.
<u>NOM-009-STPS-2011</u>	SAFETY CONDITIONS TO PERFORM WORK AT HEIGHT.
<u>NOM-010-STPS-2014</u>	CHEMICAL AGENTS POLLUTANTS OF THE LABOR ENVIRONMENT-RECOGNITION, EVALUATION AND CONTROL.

SCT NOM's
SCFI NOM's
...

Third Party Verification Requirements

ASEA E& E Regulation

- Risk analysis /ALARP demonstration
- Verification Plan

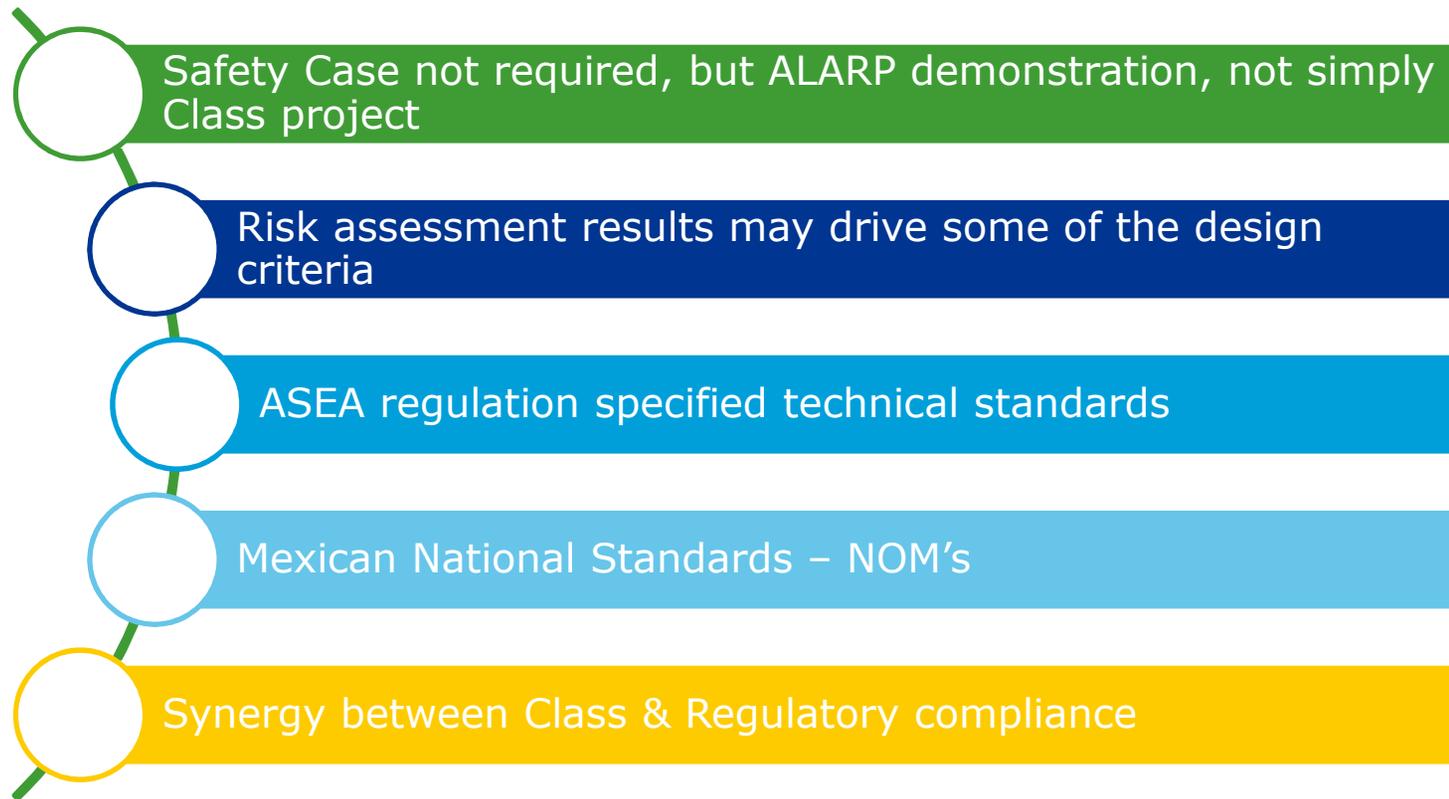
ASEA Offloading Regulation

- "Design Opinion"
- by Authorized Third Party

ASEA Methane Emission Control Regulation

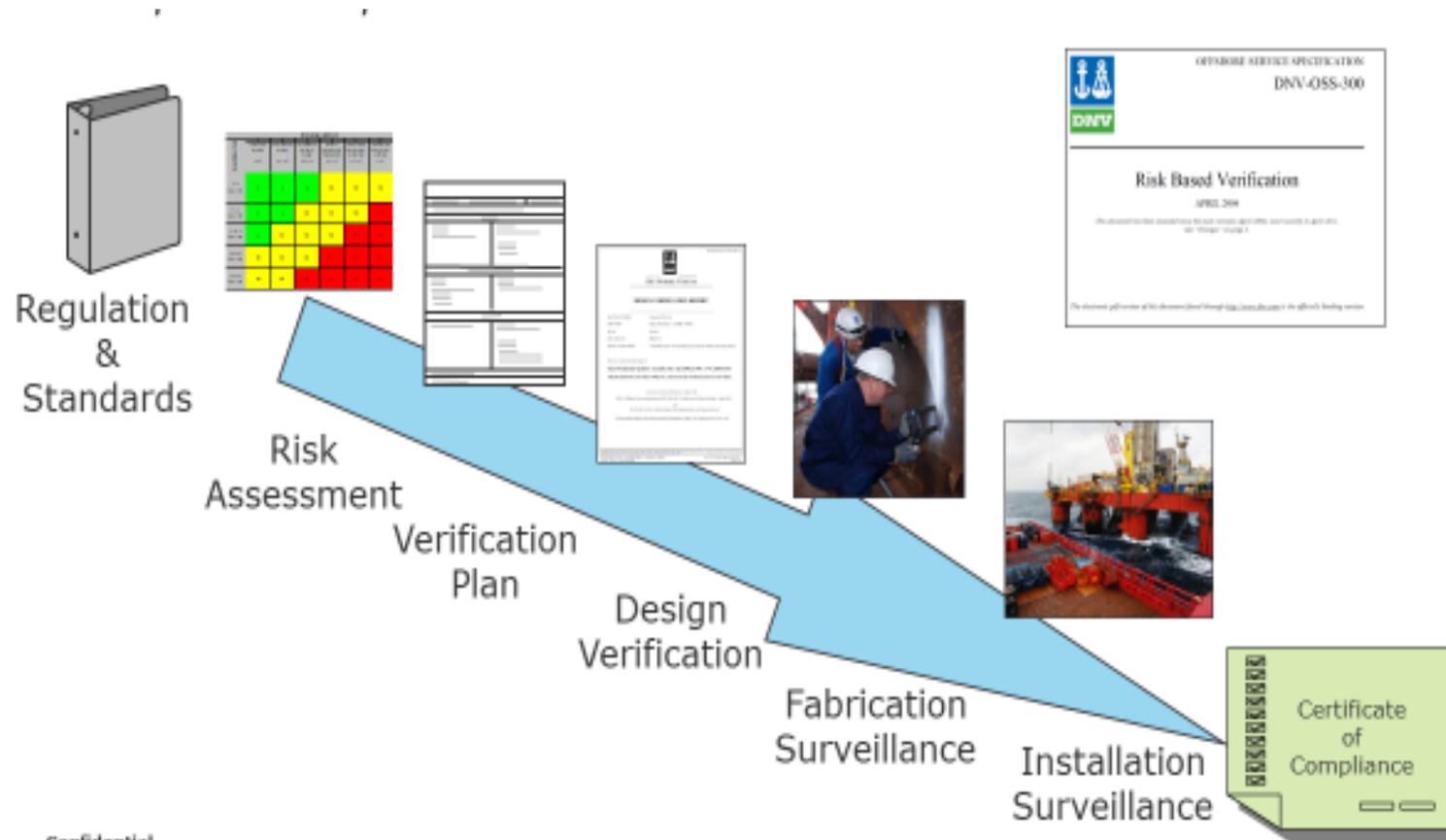
- "Technical Opinion" for
- Program for the Prevention and Integrated Control of Methane Emission
- By Authorized Third Party

Regulatory Compliance Approach



Regulators impose the responsibility on Lease Contract Owner – Auditing approach

Verification/Assurance Approach



Confidential

Other Permits (Examples)

SCT

- Arrival at National Water
- Stay in National Water
- Helideck
- ...

CONAGUA

- Discharge of waste water
- Certificate of water quality
- ...

CNH

- Metering plan
- Flaring plan
- ...

ASEA

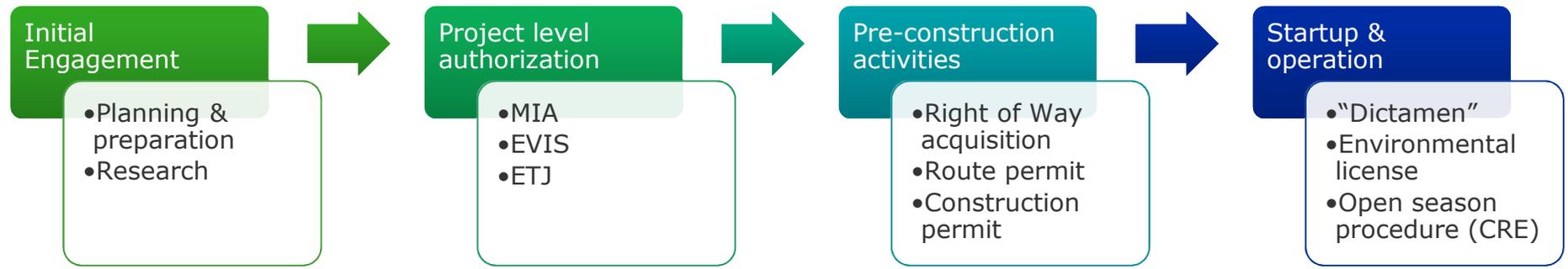
- Waste Management
- Hazardous waste
- Incidents and accidents
- ...

Regulation for Pipeline and SURF

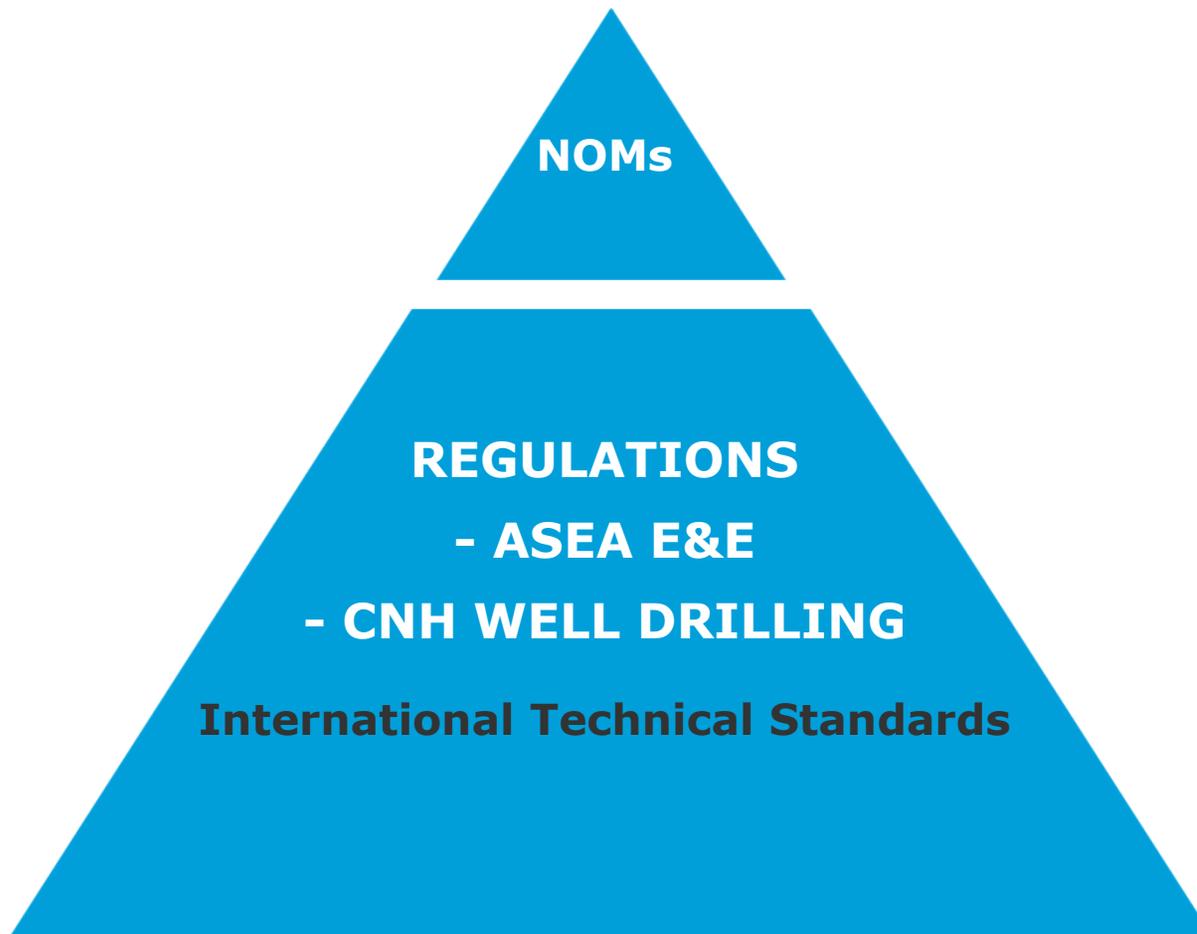
AUTHORITIES JURISDICTION

	CNH	CRE	ASEA	SCT
Well design and integrity	✓		✓	
Subsea Production	✓		✓	
Pipelines		✓	✓	
Ports				✓

Permitting Process



Regulatory Requirements for Pipelines



Technical Standards

Onshore
Pipeline

- NOM-007-ASEA-2016

Offshore
Pipeline

- **In-service Integrity Management:**
NOM-009-ASEA-2017
- **Design & construction:**
International Standards

SURF

- International Standards

Technical Standards for Subsea Equipment & Pipelines (Examples)

STANDARD	TITLE	SUBJECT
API SPEC 14A	Specification for Subsurface Safety Valve Equipment Twelfth Edition, January 2015.	SSV – Completions
API SPEC 6A	Specification for Wellhead and Christmas Tree Equipment Twentieth Edition, October 2010.	Production Equipment
API SPEC 17D	Design and Operation of Subsea Production Systems-Subsea Wellhead and Tree Equipment, Second Edition, 2011	Subsea Prod. Eq.
API SPEC 6AV1	Specification for Validation of Wellhead Surface Safety Valves and Underwater Safety Valves for Offshore Service, Third Edition, July 2018.	Subsea Production
API STD 53	Recommended Practices for Blowout Prevention Equipment Systems for Drilling Wells Fourth Edition, November 2012.	BOP
API RP 1111	Design, Construction, Operation, and Maintenance of Offshore Hydrocarbon Pipelines (Limit State Design), Fifth Edition, September 2015.	Subsea Pipelines
ASME B31.4	Pipeline Transportation Systems for Liquids and Slurries, March 2016	Pipelines
ASME B31.8	Gas Transmission and Distribution Piping Systems, October 2016.	Pipelines
ISO 15589-2	Petroleum, petrochemical and natural gas industries - Cathodic protection of pipeline transportation systems - Part 2: Offshore pipelines - Second Edition, December 2012.	Corrosion Protection

Third Party Verification Requirements for Pipeline

Stage	Chapter	Verification Frequency	Verification Type	Record Document
Design	7	Once per design	Documentary	Design Dictamen*
Construction and Start-up	9	Once per pre-start (Initial or complete shut-down)	Documentary and physical verification of the installation	Pre-start Dictamen*
Operation and Maintenance	10	Yearly	Documentary and physical verification of the installation and operation	Operation and maintenance Dictamen*

* Dictamen – technical opinion from a third party issued in a specific format provided by the authorities

Challenges



THANK YOU!

Questions? Contact:

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www.dnvgl.com

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