



Suncor Panel Presentation

January 20, 2010



Outline

- Petro-Canada/Suncor Energy Inc.
- Terra Nova Safety Plan
- Offshore Transportation
- Helideck Design and Inspection
- Helicopter Transportation Suits
- Terra Nova FPSO Safety Handbook
- Response to March 12 and Return to Service

Petro-Canada/Suncor Energy Inc.

Petro-Canada: History

- Formed by an act of Parliament in 1975 as a crown corporation and began operations on January 1, 1976.
- Became a publicly-traded corporation in 1991. The government retained a 20% stake.
- Operated both upstream (exploration, production & development) and downstream (refining & marketing) assets including:
 - Producing assets in northern & western Canada, the US Rocky Mountains, and offshore East Coast Canada;
 - Refining and manufacturing in Alberta, Ontario & Quebec;
 - Retail marketing across Canada; and
 - International and Offshore assets in the North Sea, Trinidad & Tobago, Libya and Syria.

Suncor Energy Inc.: History

- Began in 1917 with US-based parent company Sun Company conducting business in the Montreal area. The first Canadian office opened in 1919 in Montreal.
- In 1967, began commercial development of the Athabasca oil sands in Alberta.
- In recent years Suncor has been known primarily as an Oil Sands developer & operator.
- On August 1, 2009, Petro-Canada and Suncor Energy Inc. merged to create the 5th largest integrated oil and gas company in North America, the largest in Canada.

Suncor Vision and Values

Vision:

To be Canada's premier integrated energy company focused on operational excellence and high growth, with the assets, people and financial strength to compete globally.

Values:

- Safety leadership
- People
- Leadership by example
- Accountability
- Performance
- Continuous improvement in sustainability

Suncor's Business Today

A global integrated oil and gas company based in Canada

- Oil sands operations near Fort McMurray
- Natural gas in Western Canada
- Exploration and operations in the in the North Sea (UK, Netherlands and Norway) and the East Coast of Canada
- Across Canada and Colorado: downstream operations to market the company's refined products
- Refineries in Edmonton, Alberta, Sarnia, Ontario, Montreal, Quebec and Commerce City, Colorado
- Four wind power farms in operation
- Ethanol facility

History in Newfoundland & Labrador

- Petro-Canada was an early explorer in the Jeanne d'Arc Basin and offshore Labrador (early 1980's)
 - Discovered Terra Nova in 1984 (Terra Nova K08)
 - Drilled nine Terra Nova appraisal wells from 1984 to 1988
 - First wells drilled offshore Labrador; yielded gas discoveries
- Terra Nova Development
 - Second field to be developed in Jeanne d'Arc Basin
 - Operated by Petro-Canada
 - First Floating Production Storage Offloading (FPSO) facility
- St. John's Office:
 - Office opened to support exploration in the 1980's
 - Production and development operations office established in 1996 to support the Terra Nova development

Suncor's East Coast Business

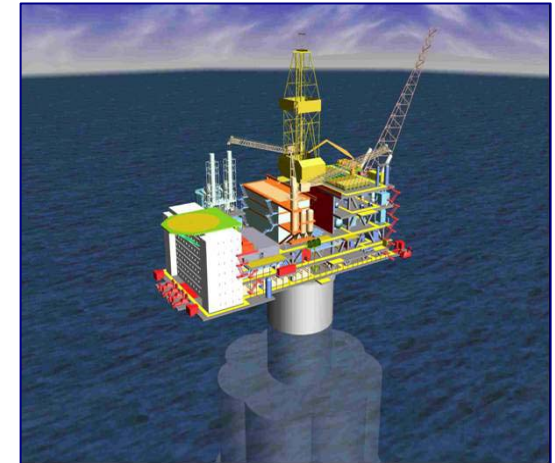
**Operator and
Co-venture Owner
Terra Nova (~34%)
2002 start-up**



**Co-venture Owner
Hibernia (~20%)
1997 start-up**

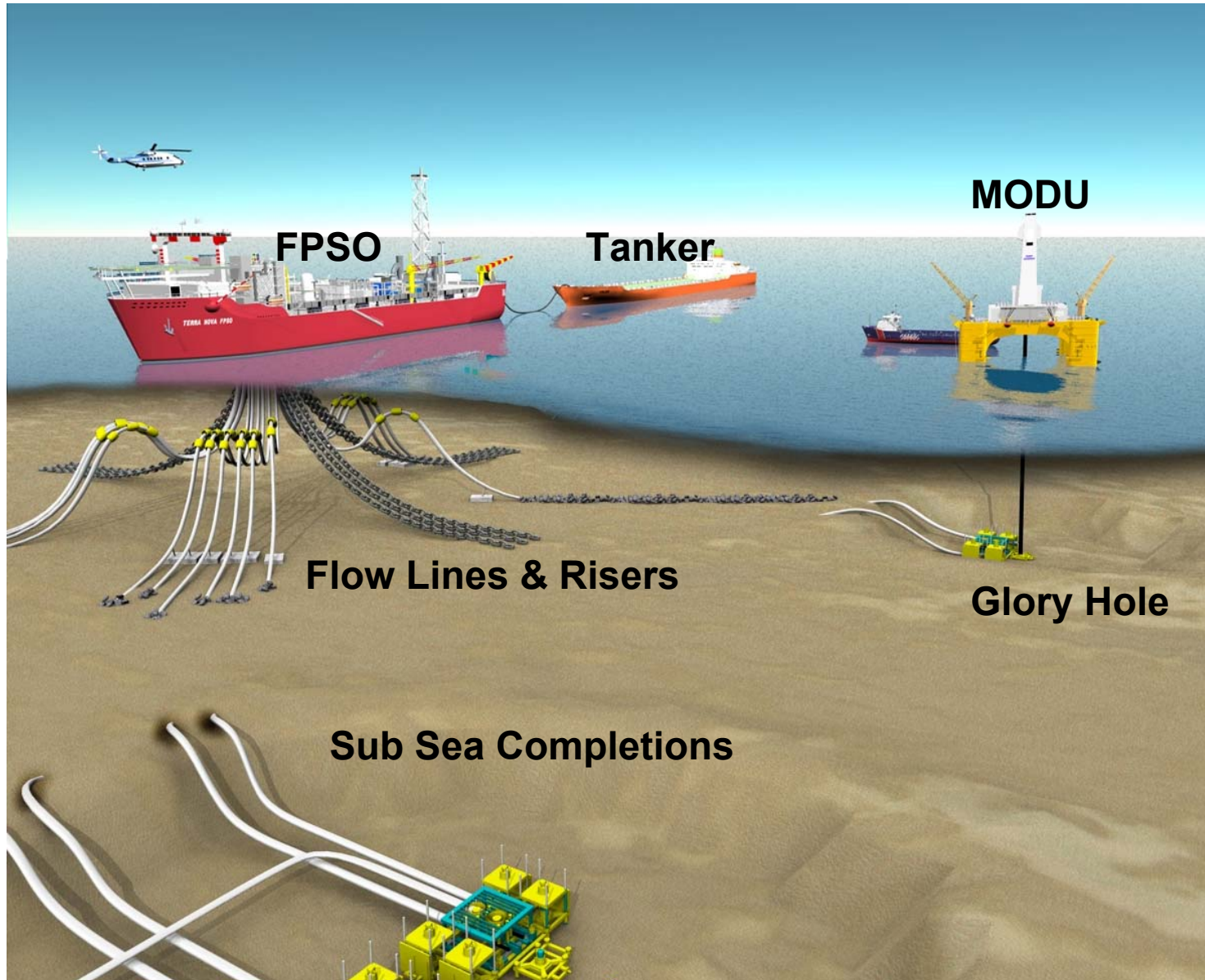


**Co-venture Owner
White Rose (~ 27%)
2005 start-up**

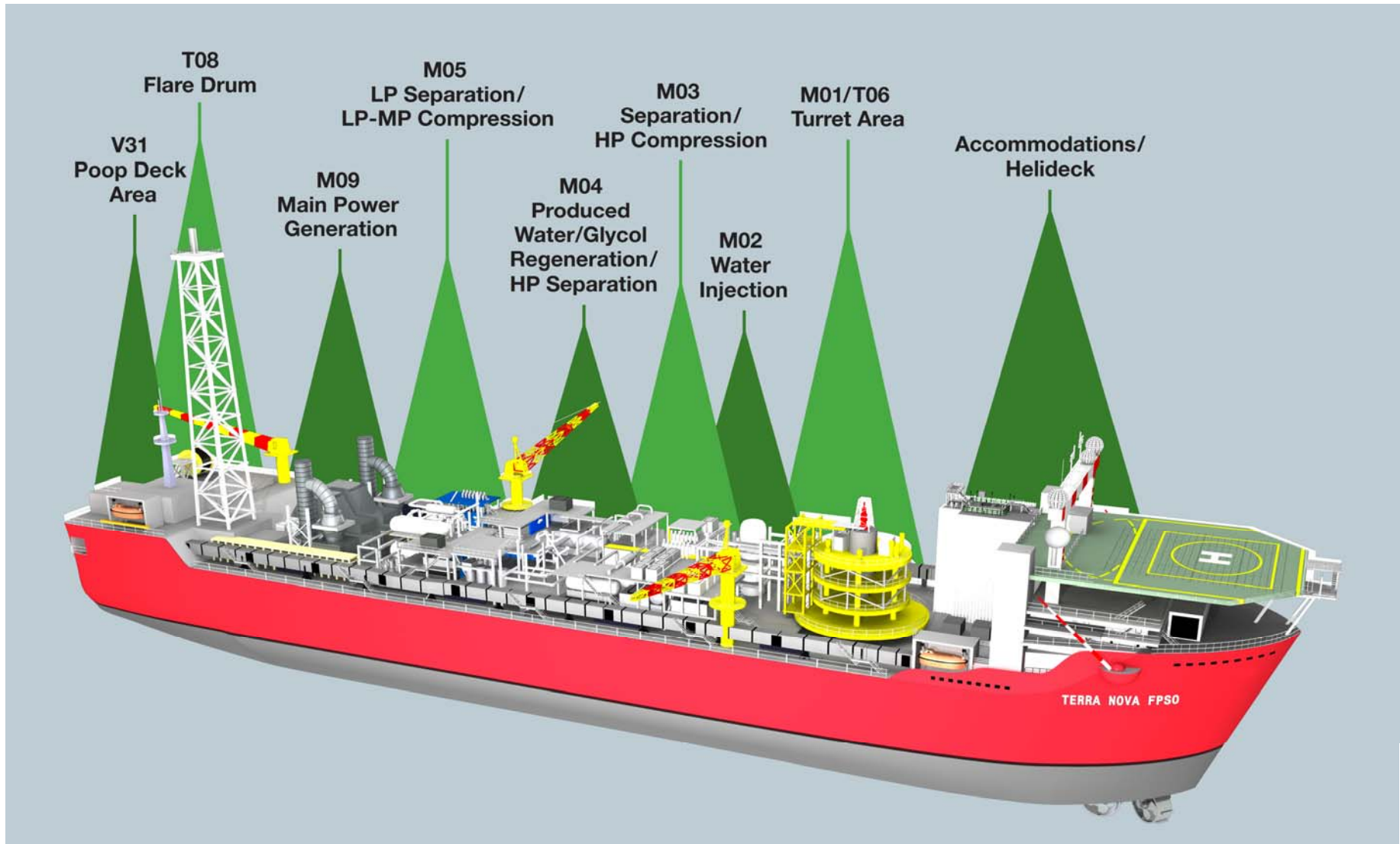


**Co-venture Owner
Hebron (~ 23%)
2017 start-up**

Terra Nova Development Concept



Floating Production Storage & Offloading (FPSO) Vessel



Mobile Offshore Drilling Unit (MODU): Henry Goodrich

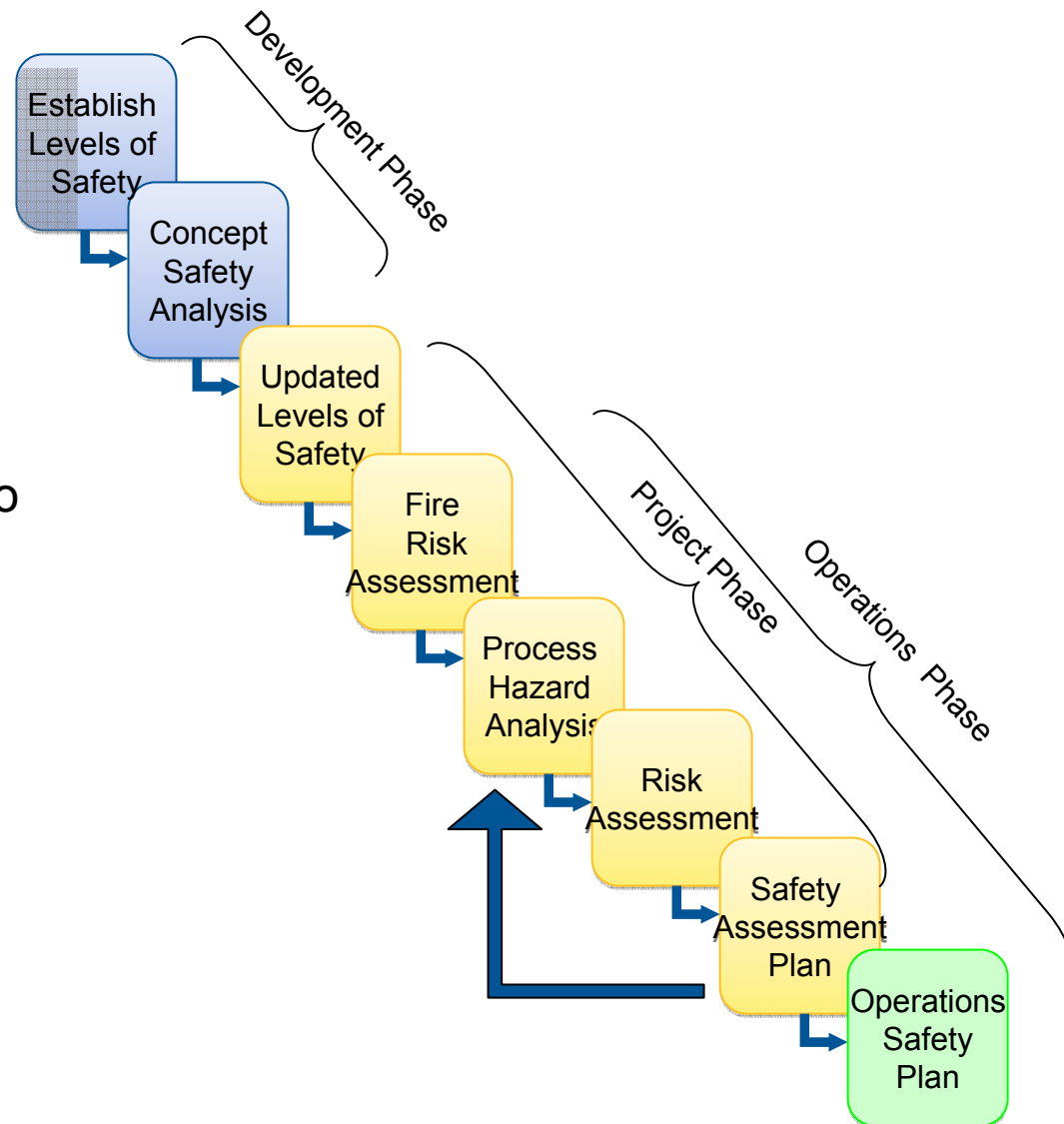
- All Terra Nova wells drilled by MODU
- Last MODU working in the Terra Nova field was the Henry Goodrich
 - Harsh environment capable
 - Accommodation: 146 persons
 - Large deck area for storage
 - 12 point all chain mooring system
 - Operating Conditions:
 - Water depth — 1524m
 - Drilling depth — 9144m



Terra Nova Safety Plan

Safety Management - Systems and Plans

- Applies to equipment, systems and people
- Begins with design and continues throughout operations to decommissioning
 - Facility Design – double hulled; safe refuge area; two escape tunnels, three lifeboats; passive & active firefighting systems
 - Ice Management Plan
 - Weather monitoring
 - Safety Zones
 - Environmental Monitoring and Protection Plans
 - Safety Systems & Training



Terra Nova's Safety Plan

**Part 1
Safety Management
System**

**Part 2
Facilities &
Equipment**

**Part 3
Operations &
Maintenance
Procedures**

**Part 4
Risk Assessment**

**Part 5
Employment Training
& Qualifications**

**Part 6
Contingency Planning
& Emergency
Response**

Demonstrates how we ensure:

- Safety & health of personnel
- Protection of the environment
- Maintenance & integrity of the offshore installation

Applies to the operating phase of the development including:

- FPSO operations
- Tanker operations
- Helicopter operations

Safety Management System Elements

Organization Structure

Total Loss Management

Quality Management

Employee Rights



Event Management

Communication &
Safety Promotion

Contractor Management

External Regulatory Interface

Corporate Approach to Safety Management

Total Loss Management (TLM) is our plan to control risk

- If you control risk & manage losses you minimize the potential to harm people, the environment and our workplaces
 - Policy – a fundamental Corporate commitment
 - Strategy – the framework for how we control risks
 - Standards define the Corporate expectations – “What” to manage
 - Business unit and regional procedures define “How”
 - Individuals must choose behaviours to minimize risk



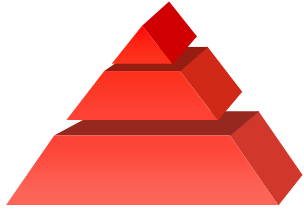
TLM Standards



- ## The TLM Standards
- **Element 1:** Leadership
 - **Element 2:** Health & Safety
 - **Element 3:** Equipment Integrity & Reliability
 - **Element 4:** Contractor Management
 - **Element 5:** Environmental Management Systems
 - **Element 6:** Employee Capability & Work Practices
 - **Element 7:** Audits & Inspections
 - **Element 8:** Stakeholder Relations
 - **Element 9:** Security & Emergency Preparedness
 - **Element 10:** Event Management

East Coast Business Processes

East Coast Management System – repository for all East Coast business process information



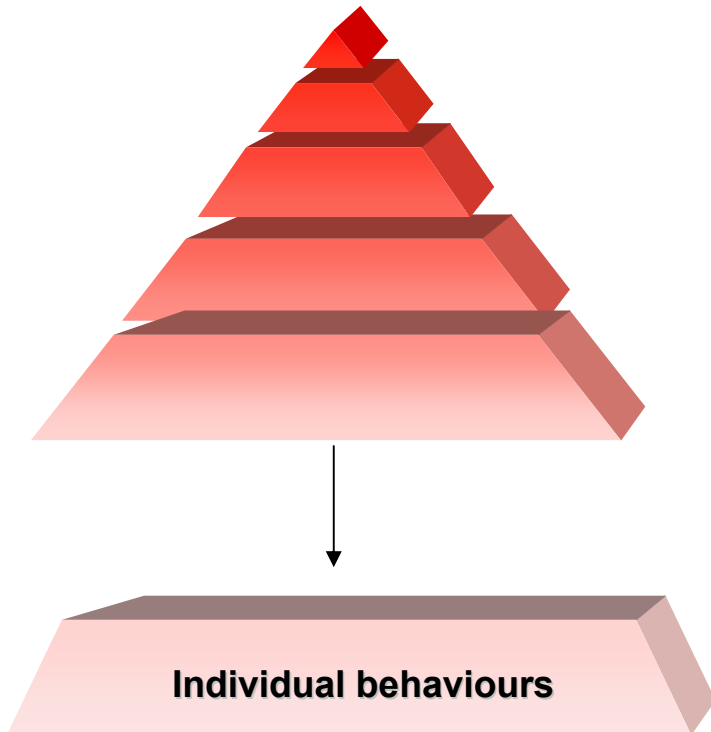
Business Unit/Regional processes



The screenshot shows the Suncor Information Gateway interface. At the top, there is a search bar and navigation tabs including Home, My HR, Workplace Services, News & Info, **Activities & Groups**, Directory, and Policies & Guidelines. The main content area is titled 'Activities & Groups: International & Offshore: Regions: East Coast Canada: East Coast MS: Process: Terra Nova Operations'. On the left, a sidebar lists various categories under 'ASSET' (Exploration, Joint Ventures, Terra Nova Operations), 'FUNCTION' (Commercial & Business Development, Drilling Comp. & Int., Technical), and 'SHARED SERVICE UNITS' (Communications, Controllers, EH & S, Information Services, Human Resources, Office Services, Supply Chain). The main content area displays a tree view for 'Terra Nova Operations' with sub-folders like 'General Operations', 'Training and Competency', 'Control of Work', 'Production Operations', 'Vessel Operations', 'Support SOP', 'Maintenance Operations', 'Campaign Maintenance', and 'Turnaround'. Under 'General Operations', several documents are listed with IDs and titles, such as 'TN-PE-MG04-X00-008 Production Reporting Manual'. On the right, there are sections for 'Related Links' (EC-DMS) and 'Document Links' (EC Org Chart, Key Inputs/Outputs & Acc - TN Operations). The footer contains copyright information (© 2009 Petro-Canada), a 'Contact Us' link, and links to the 'Privacy Resource Centre' and 'Terms of Use'.



Individual Behaviours



- Use defined practices and procedures
- Report events, near misses, hazards and observations in ProAct
- Zero Harm Behaviours
- Right to Refuse unsafe work
- Intervention is an expectation/condition of work

Zero Harm

- Safety is fundamental to our business and is a core value.
- Our objective is to reinforce safety as a value across the organization.
 - Creating a culture that supports zero occupational injuries and illnesses.
- Goal is to eliminate all occupational injuries and illnesses at our worksites.

Safety Management System Elements



Workforce Participation in Offshore Safety



Three key principles:

- “I know that no job is so routine or urgent that it cannot be done safely.”
- “I understand and follow all rules and procedures.”
- “I report all hazardous conditions, near misses and accidents.”

Worker Rights

The Right To Know!

- All workers have the right to know about any potentially hazardous situation which may be encountered in the workplace and the level of risks associated with the hazards.
 - On an on-going basis, all hazards reported are summarized on a daily TLM report which is reviewed at each shift handover.

The Right To Participate!

- All workers have the right to participate in the management of safety issues affecting the workplace.
 - OH&S Committees are in place on the FPSO and Henry Goodrich, committees meet at least once every three weeks and meeting minutes are posted.

The Right To Refuse!

- All workers have the right to refuse to perform work for which there is a reasonable grounds to believe such work may pose an imminent danger to health & safety.


Occupational Health & Safety Committees

- Objectives of Committee includes:
 - Assist in identification, recording, examination, evaluation and resolution of health and safety concerns.
 - Recommend practical procedures and conditions to help achieve the highest possible degree of health and safety in the workplace.
 - Promote educational programs to improve health & safety knowledge onboard.
 - Identify hazards through workplace surveys, reports from workers and other means.
 - Support the functioning of the Safety Management System and other initiatives for the improvement of the onboard safety culture.
- FPSO OHS Committee activities:
 - Selection of the exposure based safety program.
 - Participation in investigations,
 - Input into the Safety Performance Improvement Initiative.
 - Review/input into CAPP initiatives
 - Escape Evacuation and Rescue Guidelines
 - Training and Qualification Standard Practice

Hazard / Event Reporting

- Effective management of all events requires:
 - Timely and appropriate reporting
 - Follow-up/investigation
- What is reported:
 - All injuries (first aids, modified work, lost time, fatalities)
 - Environmental incidents
 - Damage events
 - Near misses
- Once reported management ensures the event/hazard is appropriately addressed:
 - Review at the morning FPSO Leadership meeting where corrective actions are initiated.
 - Corrective actions are closed once the appropriate investigation and actions have been completed and the results input into the reporting database.
 - Communication with the employee who raises a report.
 - All employees have access to database to enter/track status of actions and close-out.

Zero Harm Reporting Card



ZERO HARM REPORTING CARD

| | |
|--|--|
| <input type="checkbox"/> OBSERVATION <input type="checkbox"/> PRE-JOB <input type="checkbox"/> SELF <input type="checkbox"/> PLANNED | <input type="checkbox"/> HAZARD <input type="checkbox"/> EVENT <input type="checkbox"/> NEAR MISS <input type="checkbox"/> LOSS |
|--|--|

Check If Safe Check If At-Risk Check If N/A

INITIAL ACTIONS

Eyes on Task
 Not Rushing
 Balance, Traction, Grip

LINE-OF-FIRE

Body Position (Pinch Points)
 SHARP's Awareness (Sharp Tools/Edges)
 PPE (Task Specific)
 Screens, Guards, Rails
 Hazardous Energy (Isolation/Lockout)

BODY MECHANICS (ERGONOMICS)

Lifting, Bending, Twisting
 Repetitive Motions
 Reaching, Pulling, Pushing
 Standing, Sitting, Kneeling (Long Period)
 Comfortable (vs Awkward Position)

PROCEDURES & STANDARDS

Up-to-Date
 Understood (Competent)
 Followed

TOOLS & EQUIPMENT

Safe Condition (Pre-use Inspection)
 Correct For Task
 Safe Use


WORK ENVIRONMENT

Housekeeping (In Order)
 Walking/Working Surface
 Chemical Safety (MSDS/Labels)
 Observe For Other Work in Area (Conflict)

ENVIRONMENT

Loss of Containment
 Oil/Chemical Spills
 Waste Management

REV. 2
SAP #
21045423



Observation & Discussion

Description of Situation – Safe or At-Risk
Observations and/or Hazards
(who, what, where, when, how)

Causes

Immediate Action Taken/Recommendations

Date: _____ Time: _____

Observer's Name: _____

Immediate Supervisor: _____

Task Observed: _____

Operator Routine Routine Task Exemption Work Perm

Location: _____

Number in Work Group: _____

MANAGE YOUR RISKS – COMPLETE YOUR STEP BACK 5X5

Safety Management System Elements

Organization Structure

Total Loss Management

Quality Management

Employee Rights



Event Management

**Communication &
Safety Promotion**

Contractor Management

External Regulatory Interface

Offshore Safety Communication

There are a variety of offshore safety communication forums:

- Daily Shift Handover Meetings:
 - Meet at start and end of each shift for each discipline
 - All personnel are required to attend
 - Review of Events, Hazard reports and operational issues for the past 24 hours
- OH&S Committee Meetings
 - Meet at least once in each 3 week rotation
 - Minutes are posted on the bulletin board and in ProAct
- Discipline Safety Meetings
 - Meet once/rotation/discipline
 - Topics include health, safety and environment
- General Safety Meeting
 - Held once per rotation
 - All available personnel on board attend
 - Commercial, organizational and safety related issues are standing items on the agenda

Contractor Engagement in Safety

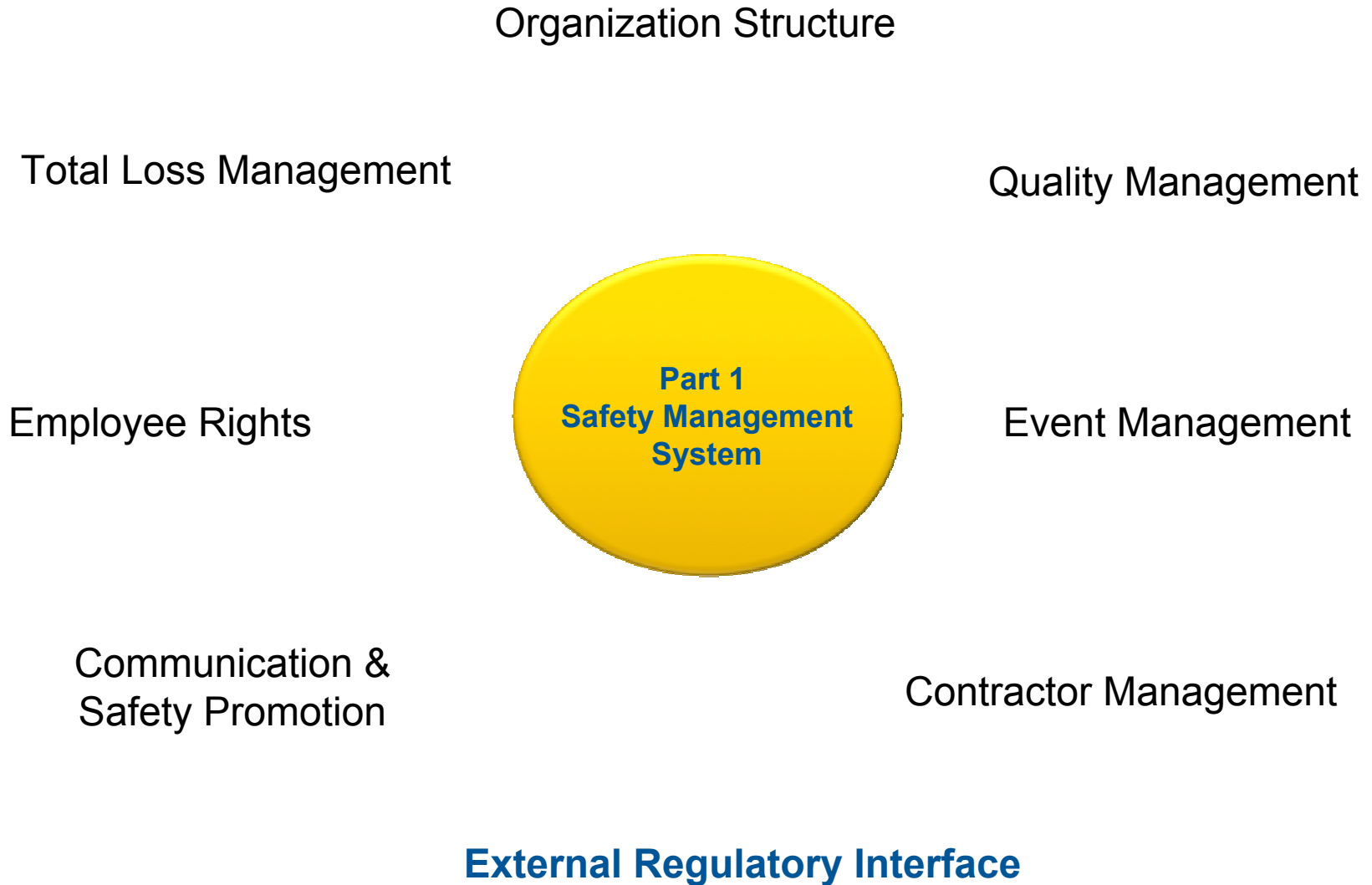
Zero Harm Forums & Wells Team Meetings

- Operations Zero Harm Forums are held 3 – 4 times per year for all contractors who support operations or have employees working on the FPSO.
- Drilling, Completions and Intervention (DCI) Wells Team Meetings are held once every six weeks.
- These forums provide opportunity for Suncor and their contractors to share safety programs and initiatives as well as discuss emerging issues.
- These forums are also an effective mechanism to ensure alignment with the objective of improving safety performance onshore and offshore.

Additional Safety Information Sharing

- Safety Alerts from events occurring on Suncor operated facilities
- Safety Alerts/Events from other operations
- Posting of inspection results and safety meeting minutes
- Posting of EH&S key performance indicators and progress
- Monthly Health Promotion Topics
- Quarterly presentations on review of Hazard Reporting trends and Control of Work Audits
- Analysis of Injury Occurrences
- Major Event announcements
- Promotion of safety goals includes:
 - North American Occupational Safety & Health (NAOSH) Week promotions
 - Posters with safety messages
 - Recognition of significant safety milestones
 - Recognition for achieving discipline objectives each month, e.g. Zero Harm Card reporting.

Safety Management System Elements



Offshore Regulatory Regime

Canada-Newfoundland & Labrador Offshore Petroleum Board (C-NLOPB)

- Management of offshore oil and gas resources including:
 - Issuance of licenses for offshore exploration and development
 - Ensuring the safe conduct of offshore operations
 - Resource conservation
 - Administering and enforcing regulations
 - Development of Guidelines and Regulations (jointly with the Federal & Provincial Government)
 - Regulatory Approvals

Lloyd's Register and DNV - Classification Society Rules

- Verifies the construction, ongoing maintenance and any modification of the FPSO/MODU in accordance with their rules for classing Offshore Installations

Transport Canada Marine Safety (TC) and Lloyd's Register

- TC Marine Safety:
 - Develop and enforce policies and marine regulations within Canadian waters
 - Delegated inspection responsibilities to Lloyd's Register with the exception of Stability, Life Saving/Firefighting, Marine Occupational Safety and Health, Manning, Regulatory Query (RQF) approvals
- Lloyd's Register
 - acts on behalf of the C-NLOPB to verify that design, construction, installation, and maintenance of FPSO or MODU satisfies the Offshore Regulations and remain fit for its intended purpose

Regulations Respecting Offshore Helicopter Operations

- The oil and gas industry is not subject to Transport Canada Aviation regulation.
- The CNLOPB has incorporated specific requirements in relation to helicopter and marine vessel operations into its regulations in support of an Application for Work Authorization.
- An Operators Safety Plan and supporting documents ensure compliance with the C-NLOPB requirements.

| | |
|---|--|
| Safety Plan Guidelines | <ul style="list-style-type: none"> ■ Contingency Planning ■ Standby Helicopter ■ Flight Following & Vessel Watch ■ Mutual Aid Agreements |
| Petroleum Installation Regulations | <ul style="list-style-type: none"> ■ Immersion Suits ■ Helideck Design |
| Petroleum Geophysical Regulations | <ul style="list-style-type: none"> ■ Helideck Design ■ Helicopter Passenger Transportation Suit |
| Draft Petroleum OSH Regulations | <ul style="list-style-type: none"> ■ Helicopter Passenger Transportation Suit |
| Drilling Program Guidelines | <ul style="list-style-type: none"> ■ Helicopter Passenger Transportation Suit |

Terra Nova's Operations Authorization

- Last renewed in 2008 for a three year period
- Suncor was the first Operator to apply under the C-NLOPB's new requirements
- A single Operations Authorization was issued that includes several of the activities that have previously been authorized on an individual basis.
- Activities that were previously under the following authorizations were “rolled up” into the “Operations Authorization”:
 - Drilling Program Authorization (DPA)
 - Production Operations Authorization (POA)
 - Well Operation Authorization (WOA)
 - Geotechnical Vertical Seismic Program Authorization
 - Approval to Pre-drill a Well (to the conductor or surface casing depth)
 - Certain well intervention activities

Communication with the Regulators

C-NLOPB:

- Daily Operations Reports
- Incident and Investigation Reports
- Monthly Production Report
- Quarterly Safety and Environmentally Critical Elements Impairment Reporting
- Monthly environmental compliance reporting
- Applications for Approval
- Audit Activity reporting
- Quarterly Management Update Meetings
- Ad hoc meetings for specific activities or issues

Transport Canada:

- Generally delegated to Lloyd's Register

Lloyds Register (LR):

- Daily Reports
- Incident and Investigation Reports
- Quarterly Safety and Environmentally Critical Elements Impairment Reporting
- Applications for approval
- Management of Change activity
- LR Audit Activity scheduling and reporting
- Ad hoc meetings for specific activities

C-NLOPB and TC Audits and Inspections

- C-NLOPB conducts one annual audit and three quarterly inspections per year.
- The scope of C-NLOPB audits and inspections is to monitor operator compliance with:
 - Regulations
 - Authorizations and Approvals
 - Conditions of Approval
 - Operator's Management System
 - Safety Plan and Environmental Protection Plan
 - Incident Management
- Security is audited by the C-NLOPB and Transport Canada annually
- Transport Canada surveys are delegated to Lloyds Register.
 - Transport Canada will periodically conduct monitoring surveys of Lloyds Register.
 - In 2009, Transport Canada conducted a monitoring survey on the FPSO.

Lloyds Register Audits and Inspections

- Lloyds Register conducts audits onshore and offshore
 - A minimum of one annual audit and 3 quarterly surveys are conducted.
 - Additional LR surveys are required to align with the Suncor inspection and maintenance schedules.

- The scope of LR audit is to ensure the ongoing validity of the Certificate of Fitness and Statutory Certificate. Surveys include the integrity management program including the following:
 - Pressure Containment
 - Electrical Systems and Generating Machinery
 - Instrumentation and Control, including Fire and Gas and ESD Functions
 - Hull and Topside Structure including Tanks, Weight Control and Lifting Appliances
 - Underwater inspection of Hull, Moorings, Risers, Flowlines, wellheads
 - Marine Systems and Utilities and lifting equipment
 - Lifesaving and Safety Appliance including Safety Radio and Communications
 - Management of Change
 - Operator Quality Management System

Operating in a multiple regulator regime

- The regulatory regime for the offshore oil and gas industry is complex and generally prescriptive.
- The regulatory regime varies based on the type of facilities operated.
- Regulatory requirements vary in a number of areas (eg. inspection frequencies).
- There is often overlap and duplication in areas such as event reporting.

Safety Management System Elements



Contractor Selection Process

- Suncor has a robust and scalable process to secure goods and services.
 - Application depends on risk and criticality of the goods and/or services being acquired.
- Once the need for a good and/or service is identified, a cross-functional team is established.
 - Ensures the scope of work is understood and that Suncor's requirements are clearly communicated.
- The core members of this team include representatives from Technical, Environment, Health and Safety, Quality Assurance, and Commercial.
 - Other departments are engaged as required including Legal, Risk Management and Communications.
- Key steps in the contracting process:
 - Develop contracting strategy
 - Solicit Expression of Interests – Prequalification (if required)
 - Issue Request for Proposal (RFP)
 - Conduct Bid Evaluation
 - Undertake Bid Clarification (as required)
 - Contract Award Recommendation
 - Contract Execution

Contractor Selection Process

- Contract Strategy
- Bid document
- Evaluation considers:
 - Effectiveness of the contractor's Environment, Health & Safety and Quality Assurance programs
 - Gaps in the bidder's programs are identified and mitigation plans are developed based on risk and criticality.
- Contract award & execution
- Kick-off meeting
- Performance Management
 - Ongoing throughout the term of the contract, the contractor's performance is measured against the contract requirements.
 - The supplier audit program audits the effectiveness of the supplier's safety and quality management systems.
- Identification of a supplier to participate in an audit is based on risk and criticality.

Suncor Audit Program

- Under Suncor's Quality Management System Internal and Supplier audits are conducted.
- The following factors are considered when developing the Audit Schedule
 - Management system processes and tools
 - Recent changes to programs/processes/people
 - Criticality of the activity or process/contract
 - Performance of the activity/supplier
 - Significant events or Work Plans for the year including supplier
 - Regulatory Requirements (including Safety Plans)
 - Audit History with emphasis on performance, findings, implementation of corrective actions in a timely and effective manner, and follow-up results
- The Audit Schedule is approved by the Senior Leadership Team
- The scope of Suppliers audits generally relates to:
 - The requirements in the contract
 - Supplier safety and quality management systems
 - Compliance with regulatory requirements

Audit Action Management

- Outcomes of all regulatory audits are managed in the event reporting database.
- Actions are assigned to a responsible person, given a corrective action plan and due date.
- Progress is monitored and reported regularly
- The Regulator will confirm when correcting actions have been addressed satisfactorily, then and audit item will be closed.

Suncor Aviation

- Suncor has a mature aviation department with well defined aviation standards. This department is centrally located in Calgary, Alberta and provides aviation expertise to the East Coast office.
- Aviation support includes:
 - Monitoring new and emerging national and international issues related to the helicopter industry.
 - Tracking of all Service Bulletin's (ASB/SB) and Airworthiness Directives (AD) mandated by the Regulatory Authorities and providing a risk assessment and mitigation plan for all bulletins.
 - Providing ongoing Civil Aviation Defect Occurrence Reports (CADOR) monitoring.
 - Monitoring the Safety Management System, Maintenance Control and Quality assurance Programs of the helicopter service provider.
 - Carrying out an annual aviation audit program with guidelines to maintain industry, safety, and regulatory requirements.
 - Interfacing with Transport Canada and participating in Transport Canada audits and inspections of the helicopter service provider.
 - Provide aviation expertise on any proposed aircraft changes.

Safety Management System Elements



Suncor's Event Management Process

- The Event Management Process addresses the reporting, investigation and analysis requirements for accidents and near-miss incidents at East Coast facilities belonging to or operated by Suncor Energy.
- Goal - To ensure that all events are reported, investigated and analyzed as required to:
 - Meet corporate and regulatory requirements
 - Improve safety and reduce risk by immediately implementing corrective actions
 - Prevent future events (lessons learned)
 - Report to senior management and partners (accountability and stewardship)

Specific Objectives

Our **Event Management System** provides a basis for:

- Continuous improvement
- Recording all events
- Investigating all events at an appropriate level
- Timely notification to management and regulators
- Statistical analysis of event data
- Stewardship reporting
- Database for tracking & analysis
- Immediately identifying risk reduction measures through corrective actions management

Safety Management System Elements

Organization Structure

Total Loss Management

Quality Management

Employee Rights

Event Management



Communication &
Safety Promotion

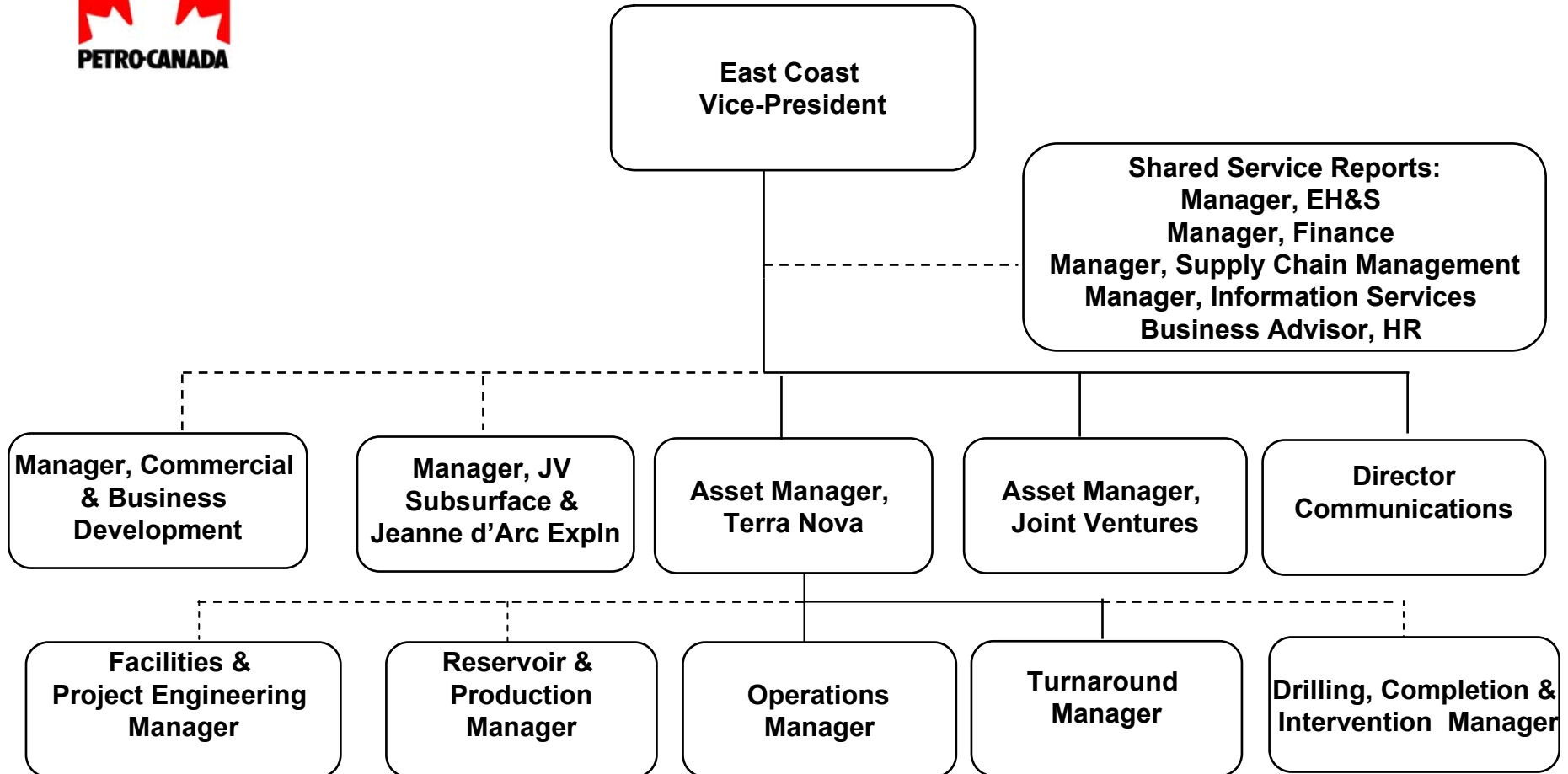
Contractor Management

External Regulatory Interface

Organization Structure

- East Coast Vice President
 - Supported by the East Coast leadership team, is accountable for:
 - Setting Environment Health and Safety performance expectations & reviewing to ensure achievement
 - Ensuring compliance with applicable safety, health, environment and asset integrity regulations, codes and standards
- Terra Nova Asset Manager
 - Provide leadership to ensure the safe operation of the installation(s), to protect the health of employees and contractors, and to protect the environment
- Line Managers
 - Ensuring safe, environmentally responsible operations
- Environment Health and Safety Manager
 - Steward of the Total Loss Management (TLM) function, ensuring alignment with TLM standards and provide due diligence in meeting EH&S obligations through monitoring, auditing, emergency response and event management and reporting
- Support Teams
 - Develop and implement procedures, strategies and plans to ensure facility integrity and ensure regulatory compliance

2009 East Coast Regional Organization



Terra Nova's Safety Plan

Part 1 Safety Management System

Part 2 Facilities & Equipment

Part 2 – Facilities & Equipment

- Vessel Design
- Station Keeping Systems
- Sub-sea Layout
- Power Generation
- Basis of Safe Operations (layout, control systems safety & environmentally critical elements)

Part 3 Operations & Maintenance Procedures

Part 3- Operations & Maintenance

- Operations Manuals
- Production Monitoring & Control System
- Simultaneous Operations
- Control of Work
- Maintenance & Engineering Integrity
- Management of Change
- Safety Inspections
- Personal Protective Equipment
- Transportation of Dangerous Goods

Part 4 Risk Assessment

Part 5 Employment Training & Qualifications

Part 6 Contingency Planning & Emergency Response

Risk Assessment



- Risk assessment and management processes are designed to:
 - Demonstrate the range of scenarios that have the potential to cause a major hazard have been identified.
 - Describe the analysis that has been undertaken for each hazard type, including consequence and frequency analysis.
 - Present overall assessments of risk to personnel and safety functions.
 - Demonstrate the adequacy of the preventative, control and mitigating measures that are in place to manage each of these hazards to ensure that risk levels remain acceptable.

Risk and Safety

Risk

- Evaluation of:
 - Potential or likelihood of an event taking place
 - Consequence of the event

Safety

- No activity is totally free from risk.
- An activity is considered to be safe if the risks associated with it are assessed as being acceptable.
- Safety is a relative attribute that can change as conditions change.

Ongoing Risk Management Practices

- There are a number of risk management tools in place to assess and manage exposures to hazards on an ongoing basis.
- Structured process hazard analysis tools include:
 - Hazard and Operability Analysis (HAZOP)
 - “What if” Analysis
 - Failure Mode and Effects Analysis (FMEA)

Ongoing Risk Management Practices

- Additional tools and processes include:
 - Job safety analysis procedures imbedded in the Control of Work System and Procedures (CWSP)
 - Procedures to manage Simultaneous Operations (SIMOPS)
 - Regularly scheduled safety audits and inspections and the resolution of issues and concerns through the Offshore Environment Health and Safety Advisor
 - Reporting and investigation of incidents
 - Preventative maintenance programs, which includes the prediction of the probability of failure of critical operating components
 - Ongoing Process Hazards Analysis (PHA) of all systems and design changes that impact personnel safety

Risk Management & Contracted Operations

- Contractors are responsible for risk management of their activities.
- Key mechanisms to ensure the overall safe performance of our contracts include:
 - Contractor regulatory compliance and monitoring/audit by the appropriate regulator
 - Contractor's safety management systems and procedures including their risk assessment processes
 - Audits and inspections
- In the case of Cougar Helicopter operations, we rely on:
 - Transport Canada regulation, certification and audit/inspections
 - Cougar's safety management systems, tools, and practices
 - Regular meetings
 - Technical and management system audits and inspections by Suncor or our joint venture partners

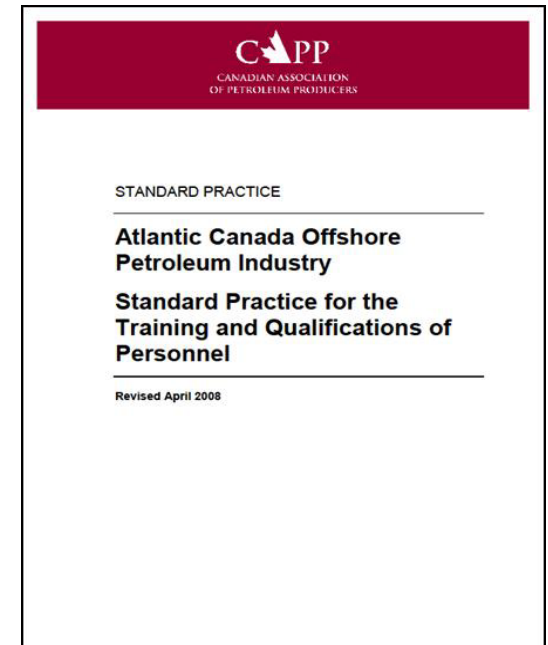
Training & Competency



**Part 5
Employment Training
& Qualifications**

Combines:

- Regulatory Training
- Facility Specific Training
 - Orientation programs
 - New Worker Induction
 - Control of Work
 - Emergency Response
- Drills & Exercises
- Vendor Specific Training
- Competency Assessment



Sample Terra Nova FPSO Specific Training

Active Learner - Microsoft Internet Explorer provided by Petro-Canada (East Coast)

Address: https://pca140.pccorp.net/ActiveLearner/Templates/WC_Main.ASP?LicCode=TERR

MANAGEMENT CENTER

| | | | | |
|---------|---|---|------------|---|
| RG0078 | 1 | Emergency First Aid (1 day) | 11/02/2009 | - |
| RG0075 | 1 | HUEBA | 11/02/2009 | - |
| RG0038 | 1 | Regulatory Awareness | 11/02/2009 | - |
| RG0034 | 1 | Fall Protection Training - One day course | 11/02/2009 | - |
| RG0003 | 1 | WHMIS | 11/02/2009 | - |
| RG0002 | 1 | H2S Awareness | 11/02/2009 | - |
| RG0001 | 1 | Basic Survival Training (5 day) | 11/02/2009 | - |
| PCK1002 | 1 | Process Operator Routines | 11/02/2009 | - |
| PCA0010 | 1 | Use of Methanol to Equalize across Mastervlve & SSSVs | 11/02/2009 | - |
| PCA0009 | 1 | Deluge & Foam System Testing | 11/02/2009 | - |
| PCA0006 | 1 | Changing Subsea Chemical Injection Filters | 11/02/2009 | - |
| PCA0005 | 1 | Pig Launching & Receiving | 11/02/2009 | - |
| PCA0002 | 1 | Changing Filters | 11/02/2009 | - |
| PCA0001 | 1 | Annulus Pressure Maintenance | 11/02/2009 | - |
| ER0027 | 1 | Respiratory Protection Awareness Training | 11/02/2009 | - |
| ER0024 | 1 | Respiratory Fit Testing Training | 11/02/2009 | - |
| ER0010 | 1 | Integrated Emergency Response Training | 11/02/2009 | - |
| CK1003 | 1 | Hydrate Management | 11/02/2009 | - |
| CK1002 | 1 | QC/DC Room Entry | 11/02/2009 | - |
| CEA0057 | 1 | Qualified Gas Tester Assessment | 11/02/2009 | - |

NOTE: This list is calculated in real-time as opposed to the last batch process used by the Training Needed Query-To list.

Records 1 through 45 of 45

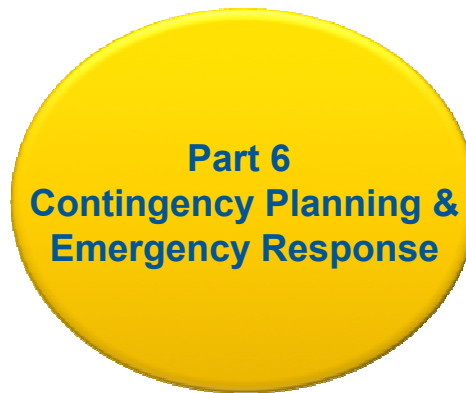
ActiveLearner © 1999-2006 Resource Development Company, LLC. Help

- Database records all training required per role
- Sample of requirements for a new Production Technician – 45 distinct requirements including:
 - Basic Survival Training or Recurrent
 - Standard Operating Procedures
 - Respiratory Protection
 - WHMIS
 - Confined Space

Contingency Planning

Logistical Support

Multi-Operator Support



Exercises & Drills

Ice & Vessel Traffic Management

Alert/Emergency Response Plans

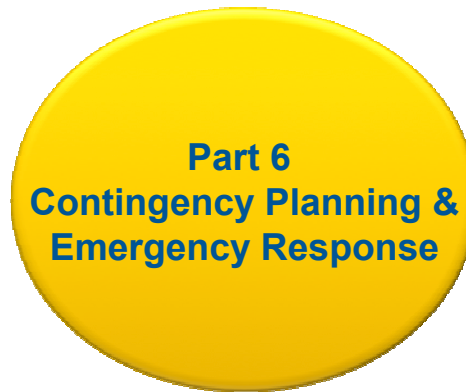
Logistical Support

- Outlines the provision of:
 - Ship/Shore Communications
 - Communications Systems
 - Search & Rescue
 - Medical Support Services
 - Flight Following and Vessel Watch
 - Oil Spill Response
 - Vessel and Aircraft Support
 - Weather forecasting and monitoring

Contingency Planning

Logistical Support

Multi-Operator Support



Exercises & Drills

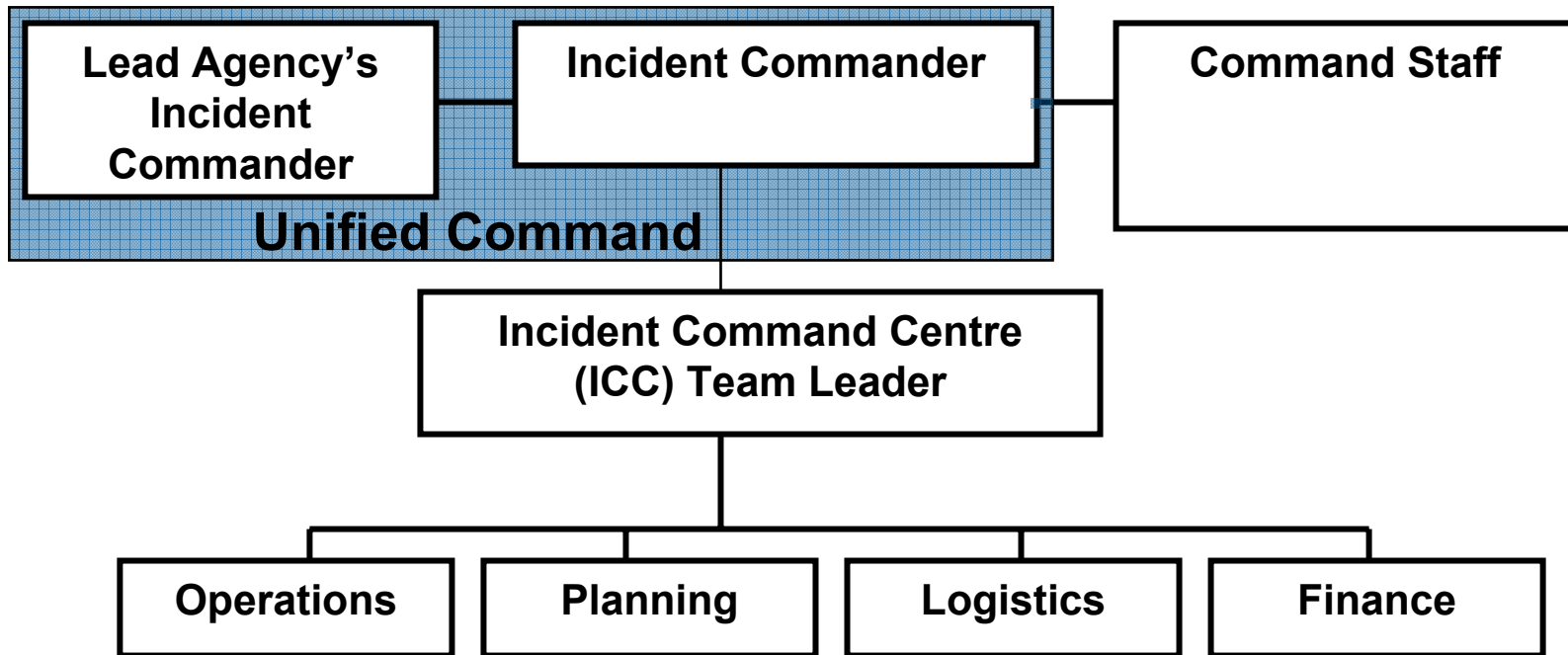
Ice & Vessel Traffic
Management

**Alert/Emergency Response
Plans**

Alert/Emergency Response

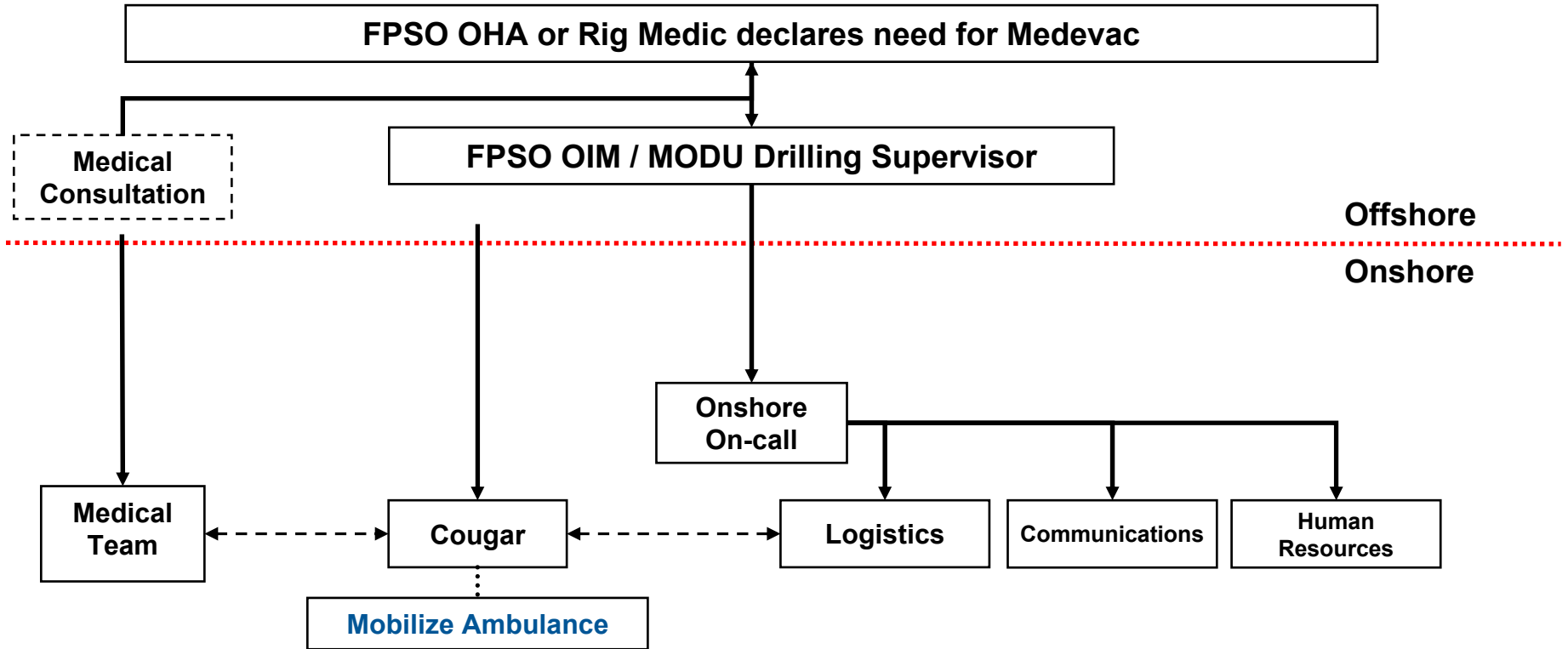
- Outlines the provision of:
 - Emergency Response Teams
 - Emergency response Communications
 - Incident Classification
 - Emergency Response Co-ordination

Emergency Response Organization



Suncor's Major Emergency Team (MET) process follows Incident Command System (ICS) structure

Medical Evacuation (Medevac) Protocol

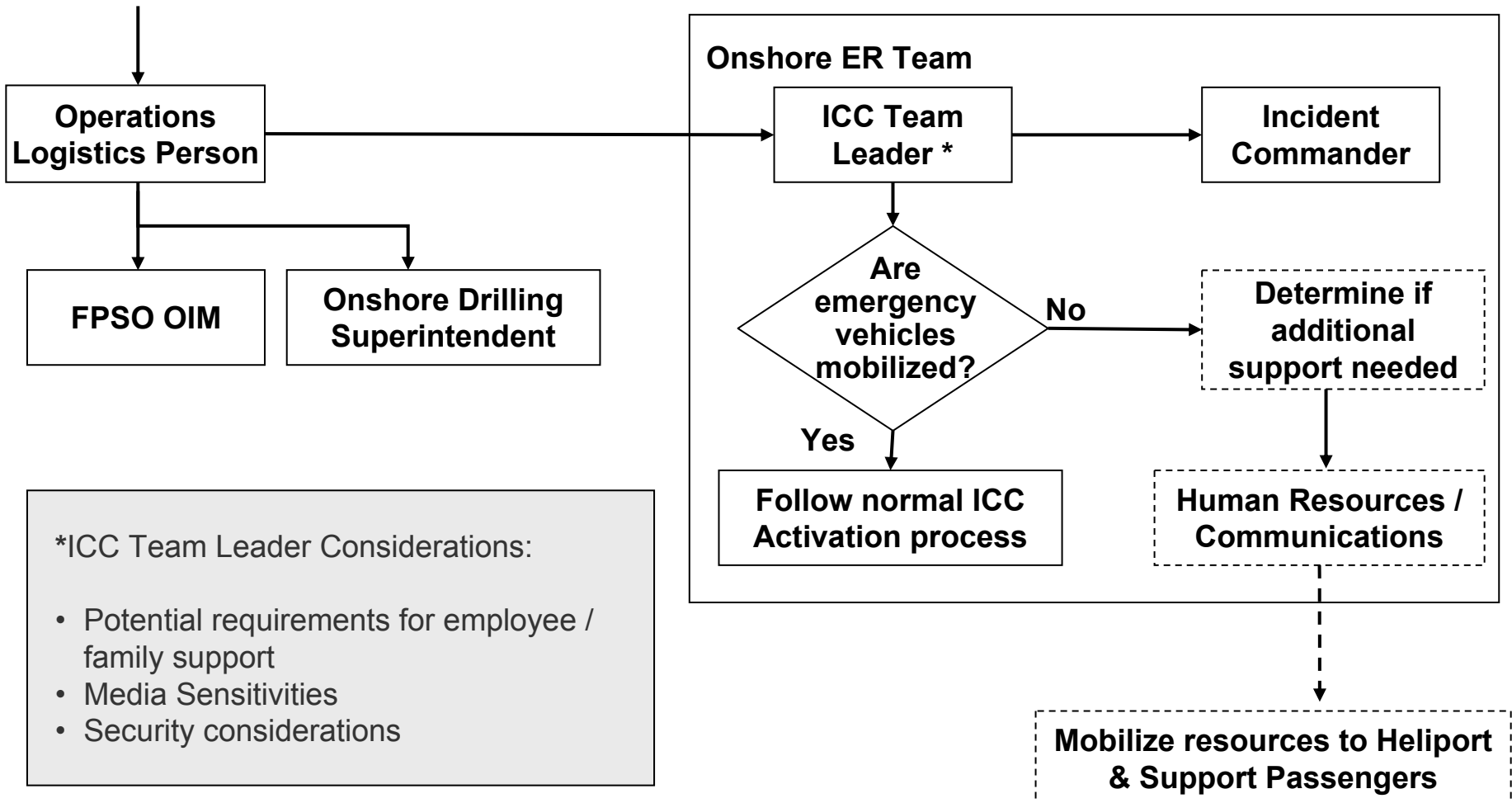


C-NLOPB is notified of all Medevacs

Helicopter Return Notification Protocols

Cougar

Scope: Any helicopter flight to or from any Suncor Facility that experiences operational issues that necessitate immediate return to the Heliport.



Offshore Transportation

Offshore Transportation

- Personnel, materials and equipment all need to get to the offshore project.
- Demand is created by offshore installation requirements:
 - Consumables (food, fuel, production chemicals)
 - Maintenance materials
 - Rotational and ad-hoc personnel
- Two gateways to supply offshore installations:
 - Marine Base
 - Facility used by all offshore operators to transport material by supply vessel
 - Helicopter Services
 - Primarily personnel transportation

Supply Vessels

- Vessels requirements:
 - Fast rescue craft (FRC)
 - Can accommodate all personnel from both the MODU and FPSO combined
 - Rescue zone & winching area
- Generally two scheduled sailings per week
- Uses:
 - Cargo Transportation
 - Personnel Transfer (secondary)
 - Standby and Close Standby when required



Use of Helicopters

- Personnel Transportation
 - Core flights for regular rotational personnel and scheduled maintenance work
 - 1 scheduled flight per day – Monday to Friday
 - Ad-hoc flights scheduled as required
 - With a drilling rig there are 3 extra scheduled flights per week
- Cargo Transportation
- Emergency Response including medevacs
- Slinging operations

Helicopter Operations

- Suncor Helicopter Operations Manual provides that helicopter operations:
 - will be undertaken in accordance with the requirements of relevant legislation and regulations pertaining to both offshore and aeronautical operations within Canadian territorial waters. Aeronautical activities shall be conducted under the auspices of Transport Canada Aviation (TCA) and C-NLOPB, who are responsible for enforcing regulations for offshore installations.*
- Offshore facilities will provide Cougar with the following information:
 - Fog
 - Wind speed/direction
 - Sea states
 - Snow/ice accumulation on helideck
 - Freezing precipitation
 - Bird activity
 - Lightning storm
 - Heave, pitch and roll of the facility

Helicopter Operations Manual

Contains detailed procedures in relation to the following:

- Aviation Policy
- Training Requirements
- Helidecks
- Helicopter Refuelling Facilities
- Weather Limitations
- Emergency Preparedness
- Flight Scheduling and Authorization
- Passenger Handling Procedures
- Cargo Handling and Manifesting
- Dangerous Goods by Air
- Flight Following Support
- Alternate Landing Sites
- Standby Vessel Status for Helicopter Operations
- Helicopter Landing / Take-off
- Pre-arrival Checks
- Helicopter Fuel Quality Control
- Transit Tanks
- Daily Quality Checks
- Preparation Prior To Helicopter Landing
- Helideck Operations
- Hoisting Operations
- Medical Evacuation (Medevac)
- First Response Capability
- Aircraft In Distress
- Helicopter Accident at the installation
- installation Abandonment / Evacuation
- Emergency and Duty Personnel Call-Out

Helideck

Helideck Structure – Certification

- Helideck Certificate of Structural Design for the FPSO was issued by Lloyd's Register on June 5, 2001.
- Lloyd's Register Design Appraisal Document for Re-certification of the Helideck for Sikorsky S-92 Helicopter was issued July 29, 2004, based on compliance with Transport Canada TP4414E Guidelines Respecting Helicopter Facilities on Ships.

Helideck Inspections

- Lloyd's Register conducts an annual inspection of the FPSO Helideck structure on behalf of Transport Canada, including the following:
 - Examination of structural aspects including helideck safety nets, markings and support structure
 - Examination of electrical/control aspects including helicopter landing/obstruction lights
 - Function test of helideck monitors
 - Survey of emergency response equipment
- Cougar Helicopters completes an annual helideck inspection.

Helideck Crew Training

- Members of the helideck team are part of the fire team
- The Crane Operator is generally the Helicopter Landing Officer (HLO) and they have specialized training.
- Training standard for the HLO is established by the CAPP Atlantic Canada Offshore Petroleum Industry Standard Practice for the Training and Qualifications of Personnel.
- Course content includes:
 - HLO responsibilities,
 - Helicopter types and design,
 - Helicopter operations including the effects of weather,
 - Helideck suitability and equipment,
 - Communications network,
 - Pre-landing considerations and preparation,
 - Landing and departure routines,
 - Helicopter start-up and shut-down,
 - Special hazards and precautions,
 - Carriage and marking of cargo including dangerous goods
 - Fuelling control and procedures

Helicopter Transportation Suits

Helicopter Transportation Suits

Issues identified by the FPSO workforce

- **March – June 2008**
 - Issues:
 - Concerns about zipping the E452 helicopter transportation suit.
 - “Tight wrist seals and improper face seal due to individual facial features.”
 - Actions:
 - Petro-Canada met with Helly Hansen to address concerns with zippers and seals and to understand modification process in relation to suit certification.
 - Cougar was asked to check all outbound passengers to ensure personnel were able to appropriately don the hood and fully zip the suits prior to departure.
 - Helly Hansen conducted survey to gather feedback.

Helicopter Transportation Suits (continued)

- **July – December 2008**
 - Reviewed survey feedback – feedback focused on wrist seal tightness and zippers.
 - Reviewed zipper enhancement opportunities.
 - Worked to establish criteria and process for suit modifications.

- **December 2008 – May 2009**
 - December/January OHS Committee Meetings:
 - Requested personnel who had specific issues/concerns which might impact their ability to don and operate in the suit to identify themselves to their respective leader.
 - Prior to March 12, 2009, one individual came forward.
 - Between March 29 and May 17, 2009, 28 individuals came forward.
 - April 2, 2009 an email reminder from Offshore Installation Manager sent to all personnel.

Helicopter Transportation Suits (continued)

- Requests for flight suit fitting resulted in a process of:
 - Individuals documenting specific concerns to focus the suit analysis.
 - Individuals sent to Helly Hansen for detailed measurements.
 - Provided Helly Hansen with photos to assist with the assessment and design process.
- Suncor's work was rolled into the industry return to service suit fitting activities which commenced in May 2009.
- OHS Committee communication on regular basis addressing:
 - Flight suit fit testing process
 - Flight Suit Water Ingress testing
 - CGSB Standards review activities

Terra Nova FPSO Safety Handbook

Terra Nova FPSO Safety Handbook

Addresses:

- Achieving Zero Harm
- TLM Standards
- Fitness to Work
- Change in Health Status
- Helicopter Departure/Arrival Information
- Transfer by Vessel
- Offshore Emergency Procedures
- Operational Safety (PPE, Worker Rights, Safety Committees, Control of Work, etc.)
- Working Safely (Equipment Safety, Working at Heights, Hand Safety & Protection, Lifting & Handling, etc.)
- New Worker Induction
- Commitment to the Environment



Response to March 12, 2009 and Return to Service

March 12 Emergency Response Activation

- 1030: On-call ICC team activated and mobilized to support Husky and HMDC
- 1040: Mobilized management / HR team to heliport to brief inbound passengers on flight 421 when they arrive
- 1115: Offshore personnel briefed by OIM on FPSO
- 1124: Inbound passengers briefed at Heliport
- 1130: Notified onshore personnel
- 1200: HR team contacted TN contractors and vendors and informed them that flight 421 inbound from FPSO had arrived safely
- 1420: Confirmed EAP assistance for other operators and FPSO
- 1435: Arranged for EAP support personnel to travel to FPSO on March 13
- 1830: The ICC stood down following confirmation from Husky ERT that no additional support was required
- Throughout: Hourly calls with Husky ERT to offer assistance / receive update. Information then communicated to FPSO OIM for further dissemination.

Return to Service Communications

- OHS Committee Meetings (Regular and Special Purpose)
- Workforce Engagement: Q&A's
- General Offshore Safety Meetings (Regular and Special Purpose)
- Meetings with Communications Energy & Paperworkers (CEP)
- Meetings with Terra Nova Employer's Organization and other contractors
- Onshore & Offshore Town Halls
- Return to Service – ProActs and Updates

