

A long-exposure photograph of a large industrial refinery at night. The scene is filled with numerous tall distillation columns, complex piping, and storage tanks, all illuminated by bright artificial lights. Long, horizontal light trails from moving vehicles or equipment create a sense of activity across the foreground and middle ground. The sky is a deep blue, suggesting twilight. A white, stylized bracket graphic is positioned above the main title text.

Process Safety Management at Neste

EPSC Technical Meeting in Cologne, 14-15.10.2016

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Neste in a nutshell

We are the world's leading producer of renewable diesel and sustainable aviation fuel (SAF).



Ca. 5,200*

Dedicated professionals, over 60 nationalities



1,683 M€

Comparable EBITDA



14.2 Mt CO₂e

GHG emissions reduction with our renewable products in 2025**.



5.5 Mt/a

Renewables nameplate production capacity across 3 continents



5 continents, 17 countries



Production in

- Porvoo, Finland
- Rotterdam, the Netherlands
- Singapore
- Martinez, CA, the U.S. (joint operation)

Our three business areas

Renewable Products

Renewable fuels for aviation and transportation, as well as other sectors globally.

Oil Products

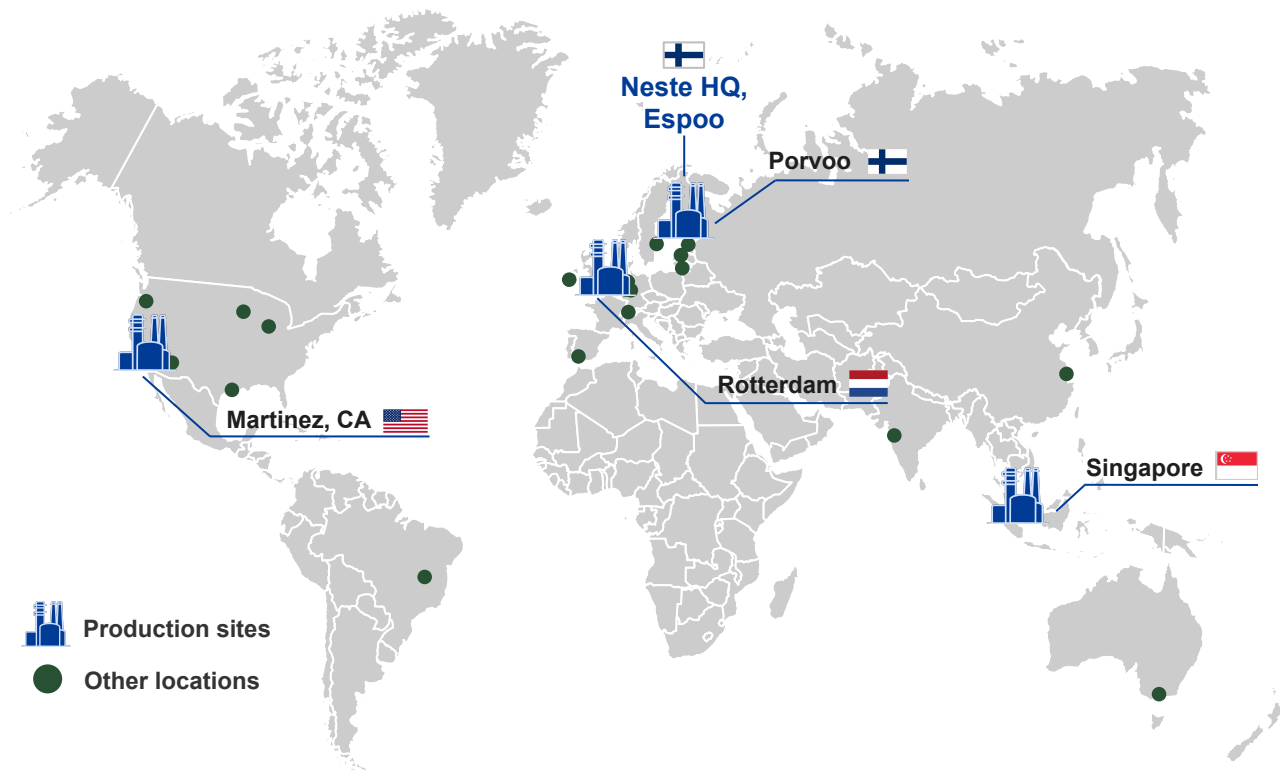
High-quality products for the road transportation, aviation and marine sectors, as well as heavy machinery and material applications.

Marketing & Services

Creates value for customers and partners with high-quality products and services to meet the evolving customer needs in Finland and in the Baltics.

*) As reported in the Financial statements release for 2025 **) Source: [Neste Annual Report 2025](#), Sustainability statement, Climate change, p. 106

Operations on five continents



Production

- Porvoo, Finland
- Rotterdam, the Netherlands
- Singapore
- Martinez, CA, the U.S. (joint operation)

Other locations

Europe

- Finland
- Belgium
- Estonia
- Germany
- Ireland
- Latvia
- Lithuania
- Netherlands
- Spain
- Sweden
- Switzerland

Asia and Australia

- Australia
- China
- India
- Singapore

Americas

- U.S.
- Brazil

Neste Vision, Strategy and Values

Vision

Neste creates sustainable solutions for transport, business, and consumer needs. Our wide range of renewable products enable our customers to reduce climate emissions.

We are the world's largest producer of renewable diesel refined from waste and residues, introducing renewable solutions also to the aviation and plastics industries.

We are also a technologically advanced refiner of high-quality oil products. We want to be a reliable partner with widely valued expertise, research, and sustainable operations

Values



Strategy

At Neste, we are leading the way towards a sustainable future. We are committed to further strengthening our position as the world's leading producer of sustainable aviation fuel and renewable diesel

Neste's priorities



Neste Management System

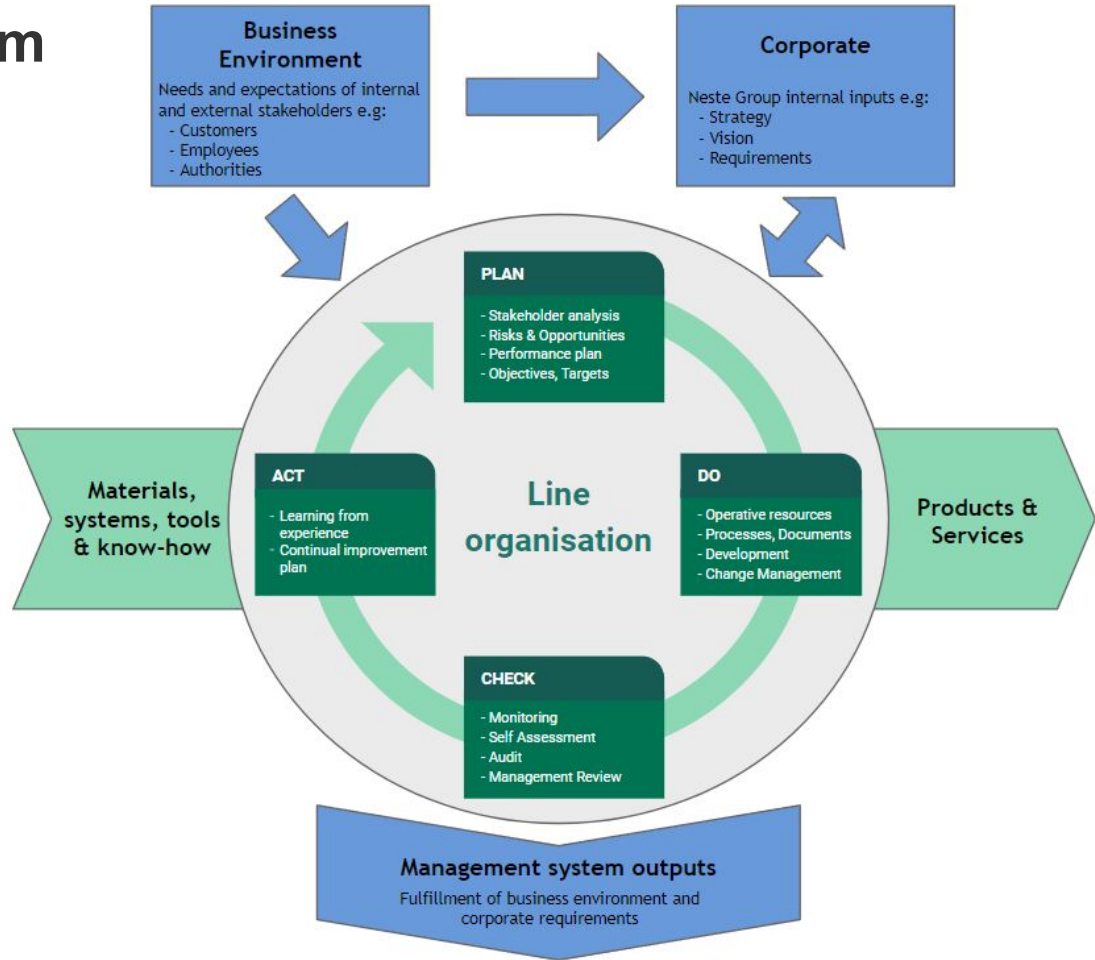
Neste's management system consists of elements presented in picture and it is fulfilling requirements in

- **ISO 9001:2015** (Quality)
- **ISO 14001:2015** (Environmental)
- **ISO 45001:2018** (Occupational Health & Safety)

Execution of the management system is done according to **Plan, Do, Check, Act** - Cycle

Most of the requirements are described in **Operations Excellence Management System (OEMS)**

Neste's Document Management System is **NMS** in which requirements are documented





Neste Management System - What is it all about

WHY

We are obliged to manage risks and improve safety, quality and environmental performance in a systematic way

WHAT

Neste uses the Neste Management System tool (NMS) as the basis for the safe organization of all work that we carry out at Neste

HOW

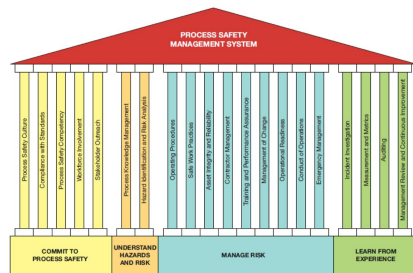
Requirements are defined in procedures on the following subjects:

- Safety & Health
- Risk Management
- Environment & Sustainability
- Quality management such as ISO requirements
- SEVESO requirements such as Safety Management System elements (VBS)
- Others

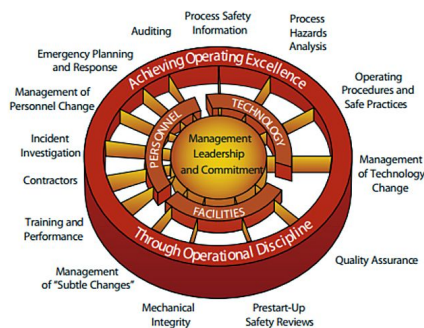
Process Safety Management consists of many different elements and there are several models

“A management system that is focused on the **prevention** of, **preparation** for, **mitigation** of, **response** to, and **restoration** from catastrophic releases of chemicals or energy from a process associated with a facility

CCPS / Risk-based Process Safety



DuPont Operational Risk Management



US OSHA Process Safety Management



ICHEME / ISC framework



Operations Excellence Management System (OEMS) consists of OE Policy and 16 Principles and related Standards

Operations Excellence (Policy)



COMMITMENT TO
OPERATIONAL
EXCELLENCE

Safety Leadership



UNDERSTAND
HAZARDS & RISKS

Hazard Identification, Risk Assessment and Control



MANAGE RISKS &
OPPORTUNITIES

Safe Storage &
Transportation

Occupational
Health

Productivity
And Efficiency

Environmental
Management

Operational
Safety

Emergency
Management

Crisis
Management

Product
And Chemical Safety

Contractor HSE
Management

Asset Integrity
And Reliability

Management
Of Change

Marine Risk
Management

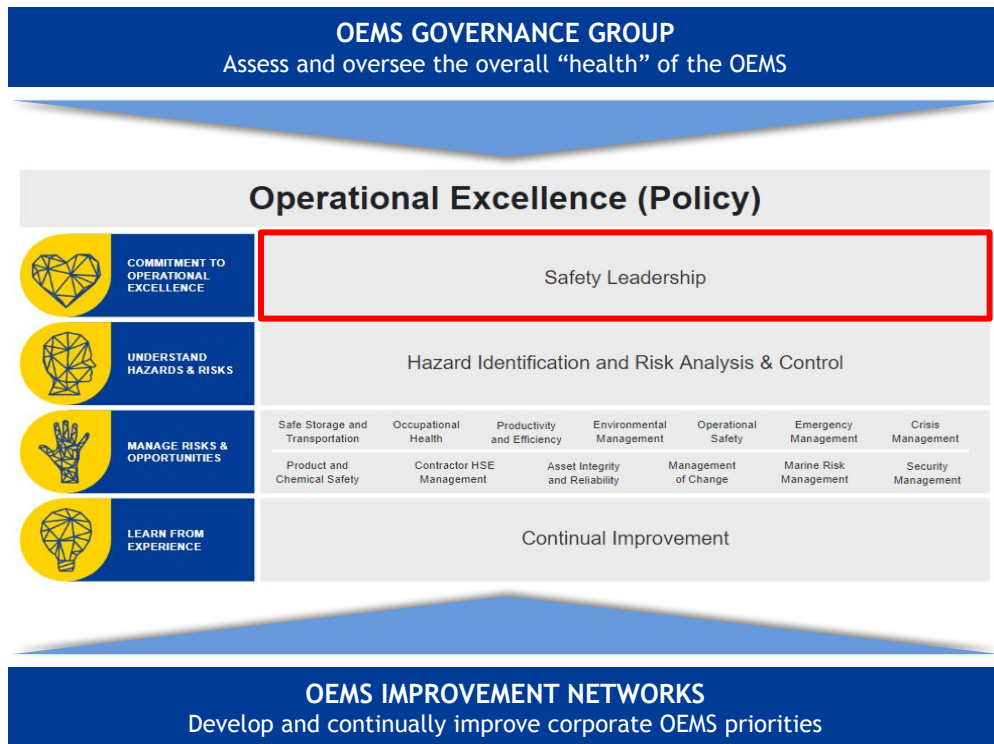
Security



LEARN FROM
EXPERIENCE

Continual Improvement

OEMS Governance model assures suitability, implementation and continual improvement



OEMS execution by line organisation

SET VISION AND OBJECTIVES

Improvement prioritization as part of Performance planning.

CONDUCT ASSESSMENTS

Recognize gaps related to expectations

DEVELOP PLAN

Define continual improvement plans for prioritized focus areas

EXECUTE AND REVIEW

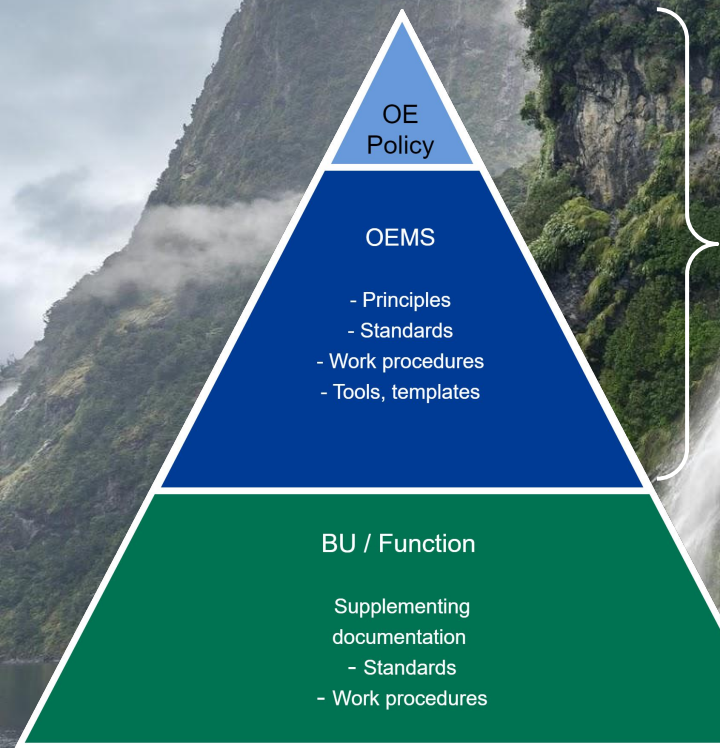
Carry out prioritized improvement actions, audit and review status



Main Objectives of Operations Excellence

- **Prevent fatalities, serious injuries and high-potential safety, environmental, security and cyber security incidents**
- **Ensure effective safeguards are in place, functioning and effective to protect people, the environment and property from the potential consequences of incidents**
- Assure health and wellbeing of our employees and contractors
- Ensure that product compliance and chemical safety hazards are effectively managed
- **Sustain asset integrity and reliable operations**
- Ensure efficient use of resources and energy by optimizing utilization, availability, cost efficiency and value creation in operations
- Ensure the excellent quality of our products and services fulfilling customer needs
- Comply with all applicable laws, regulations and permits
- **Drive continuous improvement in all OEMS elements in a consistent and systematic way.**

Corporate level OEMS requirements are linked with BU / function/ location requirements



Operational Excellence (Policy)									
	COMMITMENT TO OPERATIONAL EXCELLENCE	Safety Leadership							
	UNDERSTAND HAZARDS & RISKS	Hazard Identification and Risk Analysis & Control							
	MANAGE RISKS & OPPORTUNITIES	Safe Storage and Transportation	Occupational Health	Productivity and Efficiency	Environmental Management	Operational Safety	Emergency Management	Crisis Management	
	LEARN FROM EXPERIENCE	Product and Chemical Safety	Contractor HSE Management	Asset Integrity and Reliability	Management of Change	Mainline Risk Management	Security Management		
		Continual Improvement							

Corporate level OEMS documents define frame and minimum requirements for Neste BUs and Functions.

Operations Excellence Management System (OEMS) consists of OE Policy and 16 Principles, multiple Standards and Work Procedures

BU / function documents supplement Neste corporate level requirements and provide practical approach for users

How do we implement OEMS?

- By defining minimum requirements (valid OEMS Principles and Standards)
- Defining a top-down ownership - in all levels
- By recognizing and closing gaps to meet the minimum requirements (OEMS self assessments)
- Integrating requirements to daily management practices
- Systematic internal OEMS audits
- Reviewing and monitoring management system and reacting to changes



Neste Safety Management Principles

OEMS FLUENCY

Leaders are fluent in the OEMS structure and the associated Principles

OEMS ASSURANCE

Leaders ensure regular assurance activities take place in their businesses to drive learning and improvement

OEMS NETWORKS

Leaders are knowledgeable in the OEMS Networks and ensure support and participation from their businesses

OEMS GOVERNANCE

Leaders establish clear roles and responsibilities for OEMS activities in their businesses

MANAGEMENT REVIEWS

Leaders ensure their management teams have a shared understanding of OEMS health and assign resources for improvement

OEMS COMPETENCY

Leaders ensure proper orientation, training and competence verification procedures in their business areas

Process Safety Management



Neste Operations Excellence Management System (OEMS) - Process Safety Related Principles



Neste Safety Leadership Principles



Enabled and Capable Safety Leaders

INSPIRE & ENGAGE THE WORKFORCE

Actively involve people in Operations Excellence issues and continuous development.



Fatality and Major Incident Prevention

UNDERSTAND HAZARDS AND RISKS

Identify and understand your High Potential hazards and risks - prioritise and focus resources on the prevention of HiPo scenarios



Learning and Improving

UNDERSTAND WORK

Build a clear understanding of how work is done, who is exposed to the hazards, what makes work difficult and how you can help



HSE Compliance Assurance

UNDERSTAND LAWS AND STANDARDS

Ensure that applicable requirements and legislation are identified, understood and complied with

BUILD TRUST

Enable Psychological Safety and develop a Fair and Just organisational culture

VERIFY SAFEGUARDS

Verify & validate that safeguards are in place, functioning and effective in controlling your hazards and risks

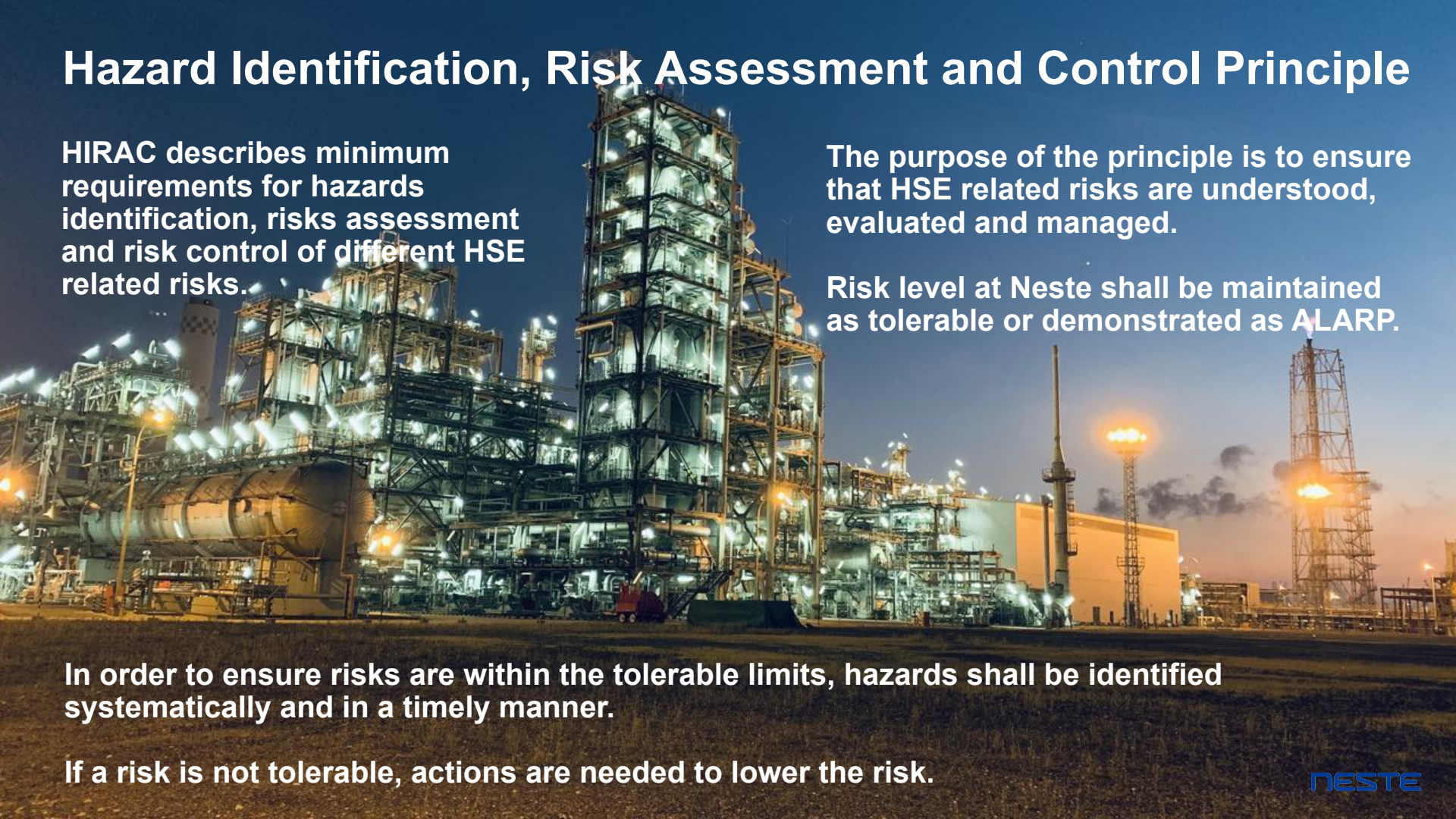
ENSURE EFFECTIVE LEARNING & IMPROVING

Ensure deep understanding of why things go wrong - respond supportively and enable lasting change

ENSURE STAKEHOLDER NEEDS ARE MET

Engage with internal and external stakeholders - collaborate and take actions to ensure needs are met

Hazard Identification, Risk Assessment and Control Principle



HIRAC describes minimum requirements for hazards identification, risks assessment and risk control of different HSE related risks.

The purpose of the principle is to ensure that HSE related risks are understood, evaluated and managed.

Risk level at Neste shall be maintained as tolerable or demonstrated as ALARP.

In order to ensure risks are within the tolerable limits, hazards shall be identified systematically and in a timely manner.

If a risk is not tolerable, actions are needed to lower the risk.

Content of HIRAC Principle

HIRAC Principle Content:

1. Risk Management Process
2. ALARP Principle
3. Hierarchy of Controls
4. Risk Mitigation
5. Risk Acceptance
6. Risk Approval
7. Risk Communication and Annual Risk Review
8. HSE Risk Management Procedures (listed on the right side here)

1. Process Risk Management
 - Process Hazard Analysis (PHA)
 - Major Accident Hazards
 - Environmental Risks
 - Process Safety Information
2. Work Risk Management
3. Construction Risk Management
4. Natural Hazard Management
5. Links to Other HSE Related Risk Management Procedures
 - Management of Change
 - Operational Readiness and Pre Start-up Safety Review (PSSR)
 - Asset Integrity and Reliability
 - Contractor HSE Management
 - ...

How do we design, build and maintain safe process units?

Hazard & Operability Study (HAZOP):

- Identification of deviations from the intended design and identify related causes and consequences.

Dust Hazard Analysis (DHA):

- Identify dust hazards and related causes and consequences.
- Replaces HAZOP in dust handling

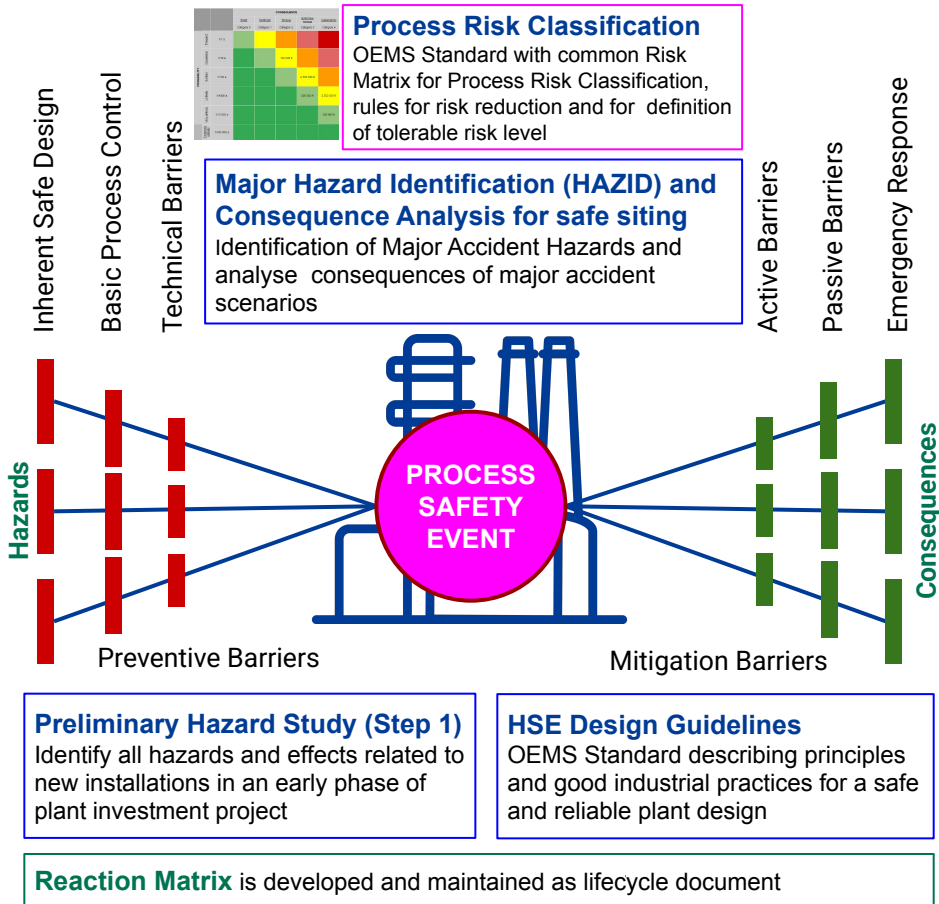
Layers of Protection Analysis (LOPA):

- Verify effectiveness of protective layers
- Define Safety Integrity Levels (SIL)
- After LOPA verification of SIL

Action Error Analysis (AEA):

- Analyse safety critical operations and procedures, identify human errors
- Verify that procedures are correct. Verify that adequate barriers exist.
- Identify Safety Critical Equipment needed for emergency shut down.

Required Process Unit Life-cycle Process Hazard Analysis



Quantitative Risk Analysis (QRA):

- Understand risks to society and plant personnel
- Input for siting, setting requirements to occupied buildings and generating hazard contours for the site.
- Storages may do comprehensive Consequence analysis instead.

Fire Hazard Analysis (FHA):

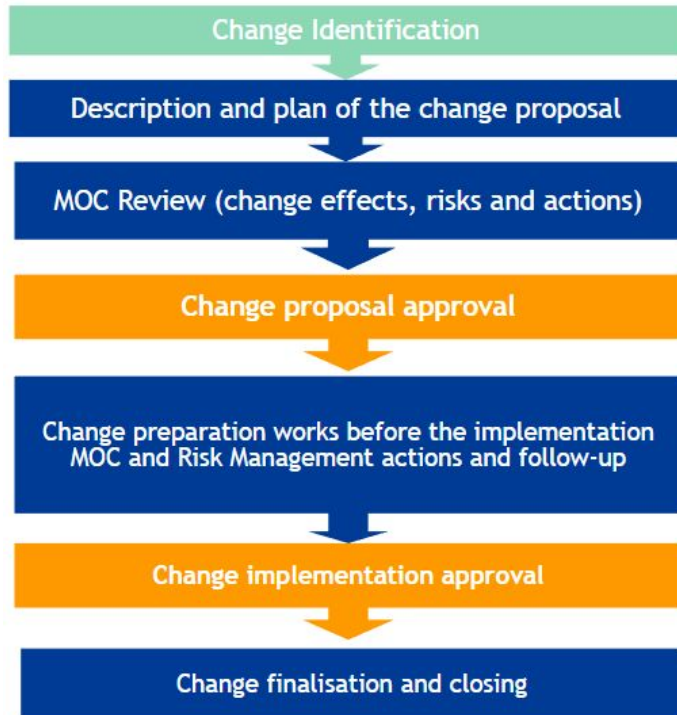
- Identify fire, explosion and toxic hazards of the plant and individual process equipment.
- Adequate barriers and safeguards required to mitigate consequences of leaks, fires and explosions.
- Define design basis for passive and active fire protection.

Layout Analysis

- Carried out in connection with the Fire Hazard Analysis
- Review the layout from safety, operability and maintenance point of view

Process Hazard Analysis in Investment Projects

Neste Management of Change - Process



1. Identification of change is a prerequisite for the MOC process
2. The change proposal describes the scope, technical basis, purpose and justification of change
3. MOC Review is a systematic review of the change proposal. Includes identification of change effects and risk assessment with actions
4. **The change proposal with MOC review requires approval.** This is done by person(s) with designated approval responsibilities
5. At this step the development of change plans and more detailed technical basis continues forward. The most important is to complete all the MOC and risk assessment (prior to implementation required) actions
6. **Before the implementation of the change an authorization review is required.** Verification that all required actions have been completed
7. After the implementation of change has been approved and executed there may be still actions that are determined to be handled after the implementation. After completing all the MOC actions the change case can be closed.

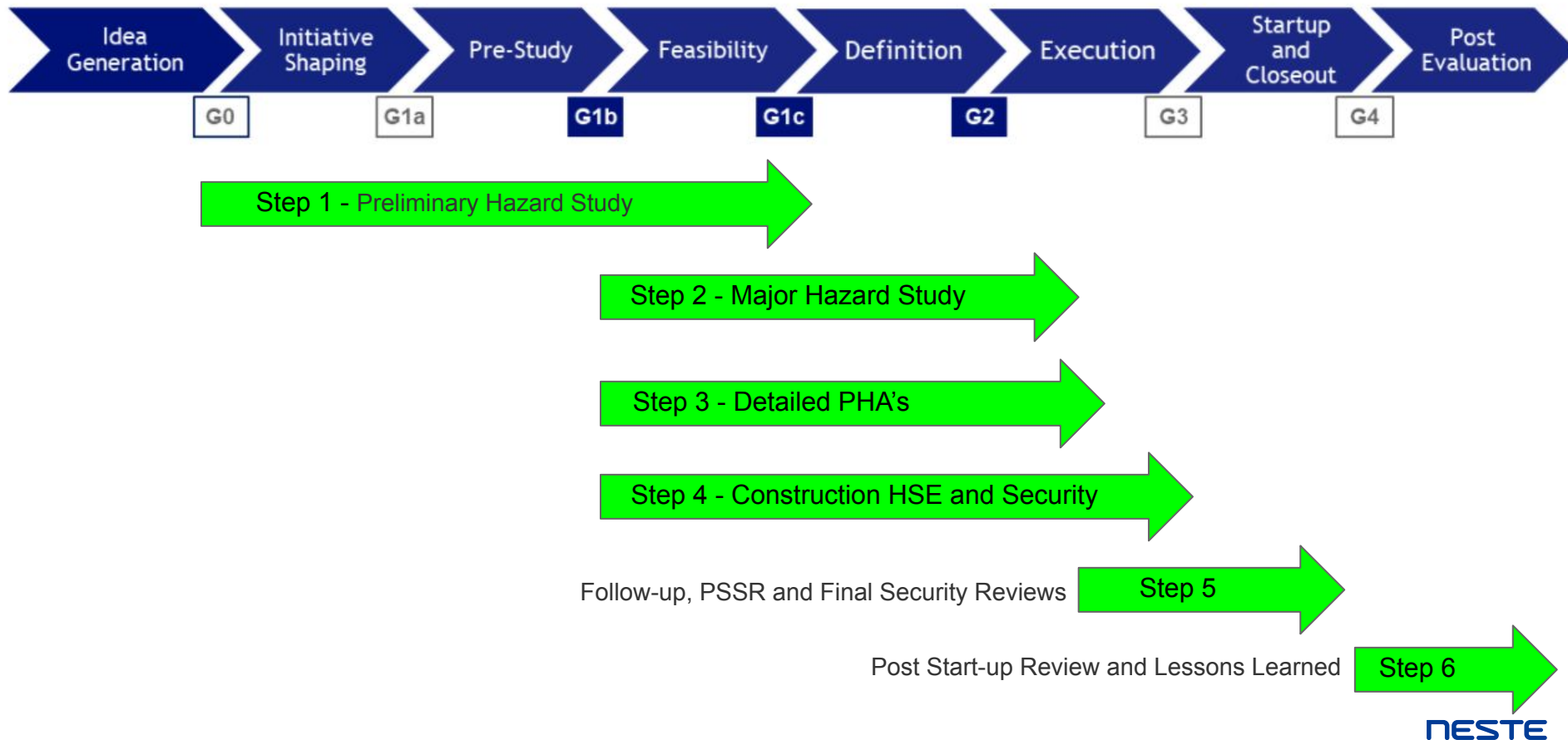


Six Step Procedure in Investment Projects

Goal is

- to prevent incidents i.e. projects shall not increase risks
- process installations are safe and environmentally sustainable and fulfill all legal and Neste requirements.
- ensure that requirements of local legislation are reviewed and implemented
- ensure safe, efficient and timely execution of the projects.

Six Step Procedure & Investments Project Lifecycle



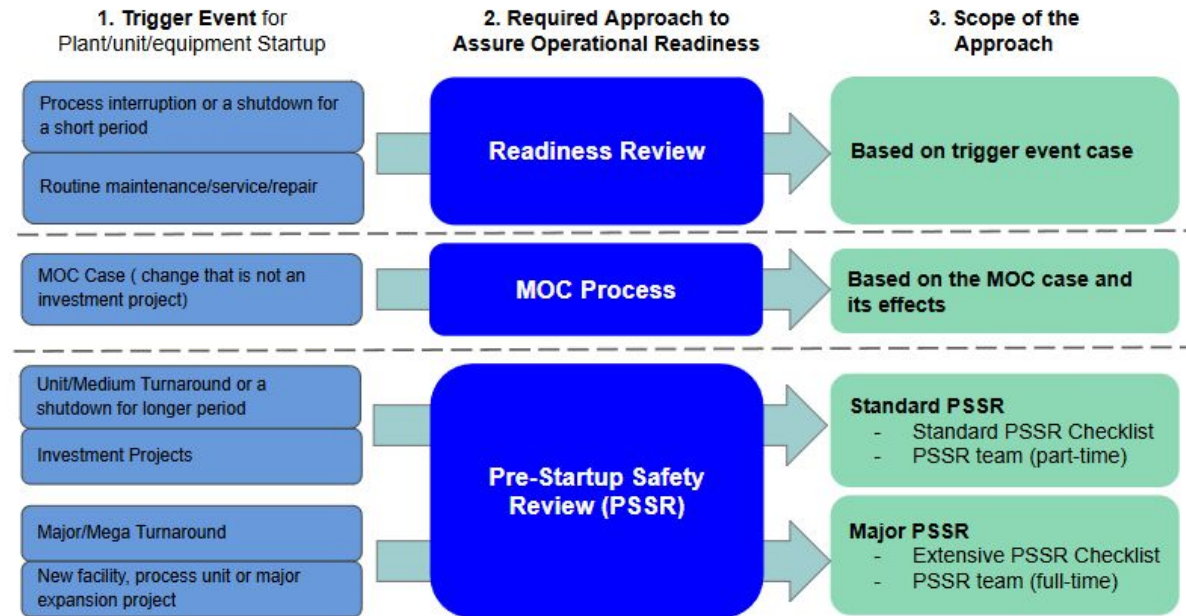
Operational Readiness is Divided into Different Approaches Based on the Trigger Event

Readiness Review is a more straightforward approach to verify safe startup of a process when compared to the PSSR, because it is dedicated for cases that do not include modifications.

MOC Process shall have a step that reviews the readiness before the implementation of a change.

Pre-Startup Safety Review (PSSR) is a more extensive approach than Readiness Review. It is dedicated for extensive modifications or new plants.

The Standard focuses most on the PSSR



Definition of the trigger events and required approaches to assure operational readiness

Asset Integrity Management Main Objectives

- Asset integrity of all equipment and components is a basis for process safety and profitable operation.
- Designing and maintaining equipment that fits for its purpose and is fit for service is most important for safety of all operations.
- Asset integrity program shall ensure that integrity of safety critical components is as originally intended.
- The Asset integrity program shall ensure that
 - correct and proper components and materials of construction are used,
 - fabrication, inspection and testing procedures are suitable and adequate
 - installation procedures recognize field installation concerns.



Neste Operational Safety Principle

High level description and requirements are given in Operational Safety Principle regarding Standard Operating Procedures.

- Necessary tools in managing process and operational safety
- Describe how to perform a task or sequence of tasks successfully
- Describe the process, hazards, tools, protective equipment and controls in detail
- Safety Critical Operating Procedure (next slides)
- Must be readily available, accurate, up to date, understood and used.
- Human factors shall be considered
- SOPs shall be regularly reviewed and updated.
- SOPs shall be formally approved and maintained under the facility management system.



Safe Work Practice Requirements in the Operational Safety Principle

- Working at height
- **Hot work**
- **Hot tapping**
- **Confined space entry**
- Excavation work
- Lifting and rigging
- **Isolation of hazardous energy**
- **Permit to work**
- **Breaking containment**
- **By-passing of safety critical equipment**
- High-pressure water jetting and blasting works
- Vacuum truck operations
- Dust and Asbestos hazard management
- **Management of deficient equipment**
- **Recording and sharing of safety-critical information**
- **Marking and control of temporary hazardous areas**
- Protection of new and young employees
- Working alone
- **Simultaneous operations (SIMOPS)**
- Work involving radioactive radiation
- Electrical safety

Neste Process Safety Fundamentals

27



Empty and De-energize Before Opening

Prepare a safe first line breaking



Operate within Safe Limits

Stay between the lower and upper operating limits



Manage Bypassing of Safeguards

Minimize the bypassing time and put temporary actions in place



Ensure Safe Isolation

Avoid relying on a single barrier like a one closed valve



Report Deficiencies on Safety Critical Equipment

Safe plant requires functioning safeguards



Identify and Manage Changes

All changes need to be evaluated and approved before implementation



Walk the Line to Ensure Operational Readiness

Comprehensive field check is the only way to confirm the readiness of process line or equipment



Monitor Transfers and Open Drains

Avoid leaving the monitoring task without stopping the transfer or drain



Control Ignition Sources

Reduce the risk of flash fire or explosion in case of leak

Emergency Management Principle

- **Emergency Management Principle** establishes the minimum requirements for emergency preparedness and response aimed at mitigating the impact of emergencies on people, environment, assets and operations
- Focus on managing emergency situations that pose an immediate risk to health, life, facilities, equipment, or the environment
- Divided to three primary categories:
 - Emergency Preparedness
 - Fire Protection
 - Emergency Response

There are also **Crisis Management Principle** that focus on supporting the responders, leading remedial actions and ensuring business continuity during **and after** the emergency situation



Fire Protection Strategy

Integrated Strategy

1 Prevention - process selection, equipment layout, good engineering, ignition control

2 Detection and response - Early detection, Isolation of fuel source and activation of the emergency response

3 Active Fire Protection - Prevent the fire from spreading and Extinguish the fire

4 Passive Fire Protection - Fireproofing, Drainage system



- Process Hazard Analysis like HAZOP, consequence analysis and FHA (Fire Hazard Analysis) give basics how extensive strategy is required
- Compliance to codes and standards is a minimum requirement

Fire Hazard Analysis (FHA)

Part 1:

- Fire Hazard Classification of Equipment (Lifecycle document)
 - Equipment LOC classification (Risk Consequence level)
 - Exceedance of flash or auto-ignition temperature
- Chemical properties, equipment holdup and process conditions.

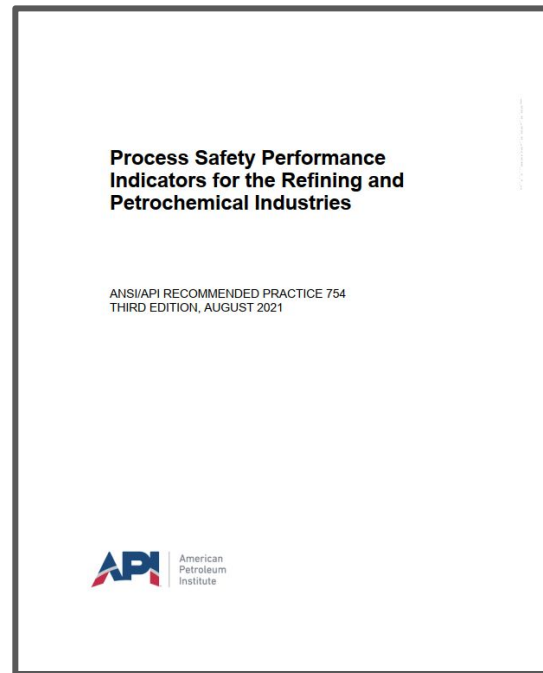
Part 2:

- Verify that the (preliminary) fire protection design is adequate to detect fires and leakages and to prevent escalation of the situation to adjacent equipment and/or units
 - Leak and Fire Detection
 - Passive Fire Protection
 - Active Fire Protection
 - Process Technical Safeguards



Process Safety Indicators (Standard)

- This Neste standard sets the framework to measure process safety performance by setting classification reporting requirements for the process safety related incidents and near miss cases
- It follows the API 754 Recommended Practice “Process Safety Performance Indicators for the Refining and Petrochemical Industries”
 - Determination of PSE Tier 1-2 are strictly set in this document, so it sets standardized process safety metrics for the industry
 - Suitable for broad reporting and industry benchmarking
 - Sets basics for PSE Tier 3-4 - these can be freely set by the company
 - Suitable for internal company or site level reporting



A long-exposure photograph of a large industrial refinery at night. The scene is filled with numerous tall distillation columns, complex piping, and storage tanks, all illuminated by bright artificial lights. Long, horizontal light trails from moving vehicles or machinery stretch across the foreground and middle ground, adding a sense of dynamic activity. The sky is a deep, dark blue. A white, stylized graphic element, resembling a bracket or a partial frame, is positioned above the main text.

Neste Process Safety Program

Neste Process Safety Program (PSP)

- background, context and taking action

Background

In December 2024 the Neste CEO requested that a multi-year process safety improvement program be initiated with the goal to improve process safety performance to protect people, the environment and improve business performance. The PSP would have the following features:

- VP Corporate Safety would lead the PSP with CEO as sponsor
- The PSP would unify process safety efforts across Neste, securing: coordination, resources and performance for the the highest value and most complex process safety improvements
- Business Areas (refineries) would be accountable for delivery of PSP elements in their operations

Context

Q3/4-2024 had been poor in respect of process safety performance. A range of incidents had occurred at all refineries with high risk and also high business losses (predominantly downtime).

Taking action: the starting scope, objectives and ambition was presented to Neste BoD on February 12, 2025. The plan was endorsed and the PSP fully initiated (see following two Slides)

Our ambition is to be leaders in Process Safety Management (PSM) - a five year Neste-wide roadmap launches in Q2-25 to deliver improvements

We will continue developing Process Safety Management at Neste to become leaders in safe, reliable and efficient refinery operations

The PSM roadmap unifies process safety efforts across Neste, securing: coordination, resources and performance for the highest value and most complex process safety improvements.

The PSM Roadmap will launch at the end of Q2, 2025

Scope and intended outcomes

Design Integrity	Mechanical Integrity	Operating Integrity	Operational Resilience	Leadership & Org.
We are confident that our assets are designed properly and that we optimise risk reduction projects and actions	Our assets are maintained in control and are reliable	We operate our assets and run our processes in the manner in which they are designed with up-to-date knowledge of the risks around us	We have the capacity to recover well from emerging situations and risks	We have skilled leaders and our organization has the capacity to continually learn and develop

Neste Process Safety Program

- a five-year, CEO led, process safety performance improvement program

Objective

Become leaders in safe, reliable and efficient operations

Highly respected company for process safety professionals

Program workstreams

Process Hazard Analysis and Risk Management

Asset Integrity

Process Safety Safeguards and Critical Activities

Process Safety Competence

Ambition

Systematic reduction of orange and red risks

Consistently identify & reduce HiPo PSE 1-4s

Process safety EUR losses reduced by 50%

Neste Process Safety Program (PSP)

Workstreams and Initiatives



Process Hazard Analysis & Risk Management

Lifecycle PHA

PHA Quality and Efficiency

Risk Transparency

Optimised Risk Reduction



Asset Integrity

Risk Based Inspection

Integrity Operating Windows

High Risk Equipment



Process Safety Safeguards & Critical Activities

Safeguard Verifications

Critical Activity Reviews



Process Safety Competence

Process Safety Academy

Process Safety Fundamentals



NESTE

Change runs on renewables