

Updates on the phase out of fire-fighting foam containing PFAS

Presented at: SCIC - Joint Agencies Dialogue Session 2025

Presented by: Stephanas Lim, Executive Scientific Officer,
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Date: 30 October 2025

Background

- Singapore is a Party to the **Stockholm Convention (SC)** on Persistent Organic Pollutants and 3 groups of Per- and Polyfluoroalkyl Substances (PFAS) are currently listed under SC for phase-out
- NEA had earlier informed the industry in 2024 that the phase-out of **firefighting foam (FF)** exceeding trace contaminant levels for the below 3 groups of PFAS will come into effect on 1 Jan 2026
 - ❑ Perfluorooctanoic acid (PFOA), its salts and related compounds: 25 ppb
 - ❑ Perfluorooctane sulfonic acid (PFOS), its salts and related compounds: 10,000 ppb
 - ❑ Perfluorohexane sulfonic acid (PFHxS), its salts and related compounds: 100 ppb
- Industry had expressed the need for clarity on (i) the transition to alternative FFs, (ii) cleaning of firefighting systems & equipment and (iii) the standards for testing of PFAS content

Development of industry guidance document

- To address industry's concerns, a Working Group comprising representatives from NEA, SCDF and the Oil and Petrochemical Industry Technical & Safety Committee (OPITSC) was formed to develop a **guidance document** for the industry
- Key areas addressed in guidance document:

1. NEA's regulatory requirements for FF

2. Considerations for the selection of new FF

3. System and equipment cleaning

4. Responsibilities and operational requirements

Key regulatory requirements

1. NEA's regulatory requirements for FF

- Phase out the import and use of FF (including training and testing foams) containing any of the 3 PFAS above their respective thresholds (i.e. non-compliant PFAS FF)

PFAS	Threshold / ppb
PFOA, its salts and related compounds	25
PFOS, its salts and related compounds	10,000
PFHxS, its salts and related compounds	100

- Companies shall provide test reports/Safety Data Sheets/technical specification documents upon request to NEA to demonstrate compliance with the PFAS thresholds outlined above
- NEA has outlined in guidance document some recommended test methods for the determination of PFAS content in FF through accredited laboratories

Foam selection, system and equipment cleaning

2. Selection of new FF

- Companies are encouraged to consider transitioning to fluorine-free foams (FFF)
- Guidance document outlines various **equipment compatibility and performance requirements, performance testing standards and operational considerations** to guide new FF selection

3. System and equipment cleaning

- Cleaning is required for parts of firefighting systems and equipment that are always pre-filled with non-compliant PFAS FF and its concentrate

System/Equipment Type	Equipment/Parts to Clean
Fixed firefighting system: Storage tanks and/or piping containing foam	<ul style="list-style-type: none">• Foam tank• Foam piping up to the foam proportioner or nearest isolation valve in which foam is always pre-filled• Foam piping network packed with foam
Foam/fire truck and foam carrier	<ul style="list-style-type: none">• Foam tank and its piping
Portable foam extinguisher	<ul style="list-style-type: none">• Replace entirely or clean if intending to refill

System and equipment cleaning (con't)

3. System and equipment cleaning

- The guidance document recommends several cleaning methods in accordance with current best practices from the industry and literature
 - Hot water cleaning, solvents, additives and/or mechanical methods (e.g. high pressure washing, surface agitation) may be used
- Companies should assess the efficacy and practicality of the cleaning method(s) employed to meet the following criteria:
 1. Residual PFAS does not exceed the trace contaminant limits; or
 2. Firefighting systems/equipment/parts have been cleaned to as As Low As Reasonably Practicable (ALARP), with justification of why the trace contaminant limits cannot be reached
- Post-cleaning, companies may establish the level of residual PFAS contamination by analysing a sample of the new FF (concentrate and/or solution) taken from the same system/equipment after a 1-month duration
- Disposal of firewater, wastewater, runoff and other wastes containing non-compliant PFAS FF shall be conducted through an NEA licensed Toxic Industrial Waste Collector (TIWC)

Key responsibilities

4. Responsibilities and operational requirements

- The guidance document outlines:
 - ❑ The need for proper documentation and management of PFAS waste during fire incidents by Site Personnel
 - ❑ The need for cooperation between companies in Mutual Aid Agreements
 - ❑ The Singapore Civil Defence Force's role in incident management

Implementation Status

- The guidance document is aimed to be published by early Nov 2025
- The phase out of firefighting foam exceeding the trace contaminant levels for the 3 groups of PFAS will come into effect on 1 Jan 2026
- Companies who require further guidance or encounter challenges in meeting the phase-out date may contact the following officers:
 - Mr Stephanas Lim at Stephanas_LIM@nea.gov.sg
 - Ms Nikki Lee at Nikki_LEE@nea.gov.sg

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Key Regulatory Updates

Presented at: SCIC - Joint Agencies Dialogue Session 2025

Presented by: Quek Jin Jin, Executive Engineer, CCMD / PCD1

Date: 30 October 2025

Scope of Presentation

1. Implementation of Mandatory Chemical Reporting Framework
2. Revised Licensing Validity Periods and Fees
3. Extended Transportation Timings
4. Exemption of Safety Audit Scheme for Major Hazard Installations (MHIs)

1. Implementation of Mandatory Chemical Reporting Framework



Background

- To recap, NEA shared at the SCIC-Joint Agency Dialogue Session in 2023 that it is implementing a mandatory chemical reporting framework for all Hazardous Substances (HS) Licence and Permit holders from 1 Jan 2026
- Objectives of chemical reporting framework are to:
 - Track and monitor chemicals that are being imported and/or manufactured in Singapore but currently not regulated by any agencies
 - Identify and prioritise unregulated chemicals that pose environmental and public health concern for potential control
 - Allow for the protection and management of the environment
- To address industry's feedback about the reporting requirements, a SCIC-NEA workgroup was formed in 2024 to jointly develop an industry guidance document

Revised Reporting Requirements Incorporating SCIC's Feedback

Scope of chemicals to be reported

1. Pure substances, including individual chemical components within mixtures; and
2. Chemical substances manufactured and/or imported ≥ 1 MT per year; and
3. Meet at least one of the criteria below:
 - a. Classified under Globally Harmonised System (GHS) as:
 - i. Category 1 and 2 acute toxicity and/or
 - ii. Category 1 acute aquatic toxicity and/or
 - iii. Carcinogenic, Mutagenic, Reproductive (CMR) toxicity
 - b. Persistence in the environment
 - c. Bioaccumulative in the environment

Exclusions: Chemicals currently regulated by other Singapore agencies, polymers, mixtures, articles and consumer products, chemicals used for R&D, unintentional impurities, naturally occurring substances, substances that are in transit through Singapore or imported solely for re-export purposes only

Information to be submitted

1. Chemical identity
2. Safety Data Sheet
3. Maximum production and/or import amount per calendar year
4. Use type

Revised Reporting Procedures Incorporating SCIC's Feedback

Reporting Frequency

- One time reporting of chemicals that are currently unregulated during first HS licence/permit renewal
- Subsequent reporting during licence/permit renewal is only required if there are
 - New chemicals (not reported previously); or
 - Changes to previously reported chemicals regarding:
 - Increase in production and/or import quantity by at least 2MT/year if the annual production and/or import quantity is less than 45MT in previous reporting; and/or
 - Chemical use type; and/or
 - Classification of any chemical properties

Reporting Format

Online via FormSG (Chemical Reporting Form)

Implementation Status



From 1 Jan 2026:

- Companies are allowed to continue dealing or using the chemicals without restrictions
- NEA will collate data and carry out risk assessment on reported chemicals
- Industry consultations will be conducted for chemicals shortlisted for potential control
- During the initial phase, NEA will implement the chemical reporting framework with a 'light-touch' approach

2. Revised Licensing Validity Periods and Fees



Revised Licensing Validity Periods and Fees

- NEA currently requires companies dealing with HS to obtain HS Licence, HS Permit and/or HS Transport Approval and renew them annually
- With effect from 1 Jan 2026, NEA will be extending the validity periods of HS Licences, Permits, and Transport Approvals from the current 1 year to 5 years
- Pro-enterprise approach to reduce administrative burden on companies and provide more certainty to businesses

Revised Licensing Validity Periods and Fees

- Concurrently, fees will be revised to bring them closer to full cost recovery, accounting for increased manpower and operating costs since the last fee revision in 2021
- Extended licensing validity results in **lower annualised fees** for new and renewal applications
 - From \$525/year to \$140/year for HS Licence and from \$160/year to \$90/year for HS Permit

HS Licence - For import, export, sale, storage or use of HS

Fee Type	Current Fees	Revised Fees
New/Renewal	\$525 (1-year validity)	\$700 (5-year validity) (or \$140/year)
Amendment (ad-hoc)	\$140	\$280
Temporary Licence (valid for 3 months)	\$135	\$200

HS Permit - For purchase, storage or use of HS

Fee Type	Current Fees	Revised Fees
New/Renewal	\$160 (1-year validity)	\$450 (5-year validity) (or \$90/year)
Amendment (ad-hoc)	\$110	\$180

Note: HS Transport Approval is not charged separately as it is cost recovered under HS Licence Fee

3. Extended Transportation Timings



Extended Transportation Timings

- NEA currently requires companies with appropriate HS or Toxic Industrial Waste (TIW) Transport Approval to comply with permitted transportation timings when transporting HS or TIW
- With effect from 1 Jul 2025, transportation timings for routes within Jurong Island (JI), Tuas and Jurong Industrial Areas have been extended from 9am to 5pm (Mon to Sat) to 7am to 7pm daily
- Risk-based approach to reduce regulatory burden on industry and provide greater flexibility to businesses while safeguarding the health and safety of the general public

Permitted Transportation Timings for HS and TIW

Approved Routes	Timings (Before 1 Jul 2025)	Revised Timings (From 1 Jul 2025)
Within Jurong Island/Tuas/Jurong Industrial Areas	For HS: 9am to 5pm, Mon to Sat, excluding Sun and Public Holidays For TIW: 7am to 7pm, Mon to Sat, excluding Sun and Public Holidays	7am to 7pm, daily
Other mainland areas	9am to 5pm, Mon to Sat, excluding Sun and Public Holidays	No changes

4. Exemptions of Safety Audit Scheme for Major Hazard Installations (MHIs)

Exemption of Safety Audit (SA) Scheme

- SA scheme is a self-regulatory framework to help companies systematically identify weaknesses in their safety management systems, with SA reports submitted to NEA biennially
- With effect from 1 Jun 2025, companies classified as Major Hazard Installations (MHIs) and subjected to the MOM's Safety Case Regime are no longer required to submit safety audit reports to NEA
- Reduces administrative burden on MHIs as they are already required to carry out similar audits under MOM's Safety & Health Management System (SHMS)
- Existing SA requirements and biennial submission of reports to NEA remain unchanged for non-MHIs

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Minimum Energy Efficiency Standard (MEES)

Presented at: SCIC - Joint Agencies Dialogue Session 2025

Presented by: Weng Shiya, Deputy Principal Engineer, IR2D / CMD

Date: 30 October 2025

Reasons for MEES

- While a high-efficiency design is important for the industrial system, **this alone does not guarantee that the system is being efficiently operated**
- **MEES being based on operating conditions of the industrial system**, ensures that the system is operated efficiently throughout its lifespan to achieve greater energy savings
- **Water-cooled chilled water systems (WCCWS) is identified for MEES**
 - The largest common electricity consumer in industrial facilities (**~16% of total electricity use**)
 - **> 70%** of WCCWS are currently operating **below optimal efficiency**, based on 2016 energy use reported by companies regulated under the Energy Conservation Act (ECA)
- **Industry is consulted** before the MEES requirements are finalised
 - industrial facilities, industrial associations (such as SCIC), ESCOs are consulted

Implementation time-line

- MEES for regulated chilled water systems is implemented in phases
- New developments have been subject to MEES requirements since 1 Dec 2020
- Existing industrial facilities starting with Registered Corporations under the ECA, will need to meet the requirements by 1 Dec 2025
- The remaining existing industrial facilities to comply by 1 Dec 2029
- Details on MEES requirements are published on NEA's website for industry's reference

Key insights from SCIC

SCIC Industry feedback paper from SCIC Energy Efficiency Working Group in June 2025

Practical MEES
thresholds

Flexibility to comply
with MEES
requirements

Adequate
implementation
runway

Target larger systems
for MEES

Leeway to consider
MEES appeals

Greater support for
implementation

The insights are generally aligned with NEA's considerations in developing MEES

Establishing MEES (1/2)

Key considerations

- Varying cooling requirements across industry for their manufacturing processes
- Chiller capacity regulated for MEES

Addressing the considerations

- MEES threshold based on chilled water supply temperature instead of a single level is adopted
- Referencing established standards - BCA's Green Mark standard is used as benchmark when developing MEES
- Target at large water chiller systems i.e. size ≥ 300 RT as they are able to achieve good payback potential due to their scale

Establishing MEES (2/2)

Key considerations

- Providing adequate runway for implementation
- Providing support to industry

Addressing the considerations

- MEES requirements were announced in 2019, giving industry ~ 6 years of lead time to prepare for the compliance
- EDB's REG(E) grant support for industry to adopt energy efficient equipment and technologies
- The project eligibility abatement criteria was lowered from 500 tonnes/yr to 250 tonnes/yr, to enable more companies to tap on the grant

ECA framework allows for appeal considerations

- There are some that face genuine extenuating circumstances to comply (e.g. process safety reasons, economical constraints, operational constraints, low cooling load demand etc.) and have appealed to NEA
- As each appeal case is unique, NEA will have to assess and grant the waivers on a case-by-case basis, with relevant supporting information from the companies
- To give assurance on their appeal request before the requirements come into force on 1 Dec 2025, NEA has been in close communication with the companies to understand their circumstances and working with them on their requests

Working hand-in-hand with industry

- NEA notes the suggestions in SCIC's industry feedback paper and will consider (including adapting) them for future reviews on MEES and other EE policies and initiatives, where feasible
- NEA has been working closely with the industry, SCIC and other relevant industry associations and engaging them early when formulating new policies and initiatives to drive industry energy efficiency; and will continue to do so

Published MEES Information on NEA's Website

- [Minimum Energy Efficiency Standards](#)
- [Climate Change & Energy Efficiency Circulars](#)

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