SAFE AND EFFECTIVE PFAS REMOVAL FROM FIREFIGHTING SYSTEMS NOW GUARANTEED AND CERTIFIED

Public and private fire services, as well as industrial and logistics (storage) companies, frequently use fluorinated foam for effective incident response. This foam is stored in foam tanks, both in vehicles and in fixed firefighting systems. PFAS (poly- and perfluoroalkyl substances) in this foam have adverse long-term effects on human health and the environment. Due to upcoming European restrictions on the use of PFAS, more organisations are switching to foam that does not contain PFAS.

When replacing fluorinated foam with a fluorine-free variant, PFAS residues may remain in the fire protection system. To prevent PFAS residues from entering the environment through the new foam, firefighting systems must be adequately cleaned. Various firefighting and cleaning companies in the market have developed cleaning processes for this purpose. There are significant differences in the cleaning processes, but these differences are less important as long as they yield comparable results. There is a market demand for clear frameworks for cleaning, sampling, analysis, and waste disposal, which need to be codified in a guideline to ensure safety and quality.

Foam systems use a concentrate that may also contain elements such as PFAS to meet specific fire protection performance standards. This may be based on:

- Fire protection systems with foam concentrate according to the EN1568 series, applied according to NFPA 11 and/or EN 13565-2, or
- Fire protection systems with a water/foam mix, applied according to NFPA 16 and/or EN12845.

PROJECT GROUP OBJECTIVE

A broad project group in the Netherlands has established standardised frameworks for the cleaning process of PFAS-containing firefighting systems. This project group consists of cleaners, industry representatives, authorities for industrial firefighting and the environment, and certification bodies. The project is initiated and coordinated by Kappetijn Safety Specialists.

The cleaning focuses on foam tanks and pump and mixing systems, including all connections and other components of a firefighting system that contain foam concentrate. These frameworks have been included in a guideline that ensures a safe, risk-resistant, cost-effective, and qualitatively efficient cleaning procedure, which is reproducible with a uniform determination of results. This cleaning process has the following objectives:

- Clear quality criteria for the cleaning process;
- Ensure that firefighting foam and systems comply with new European legislation;
- Professional execution of the service and maintenance processes of firefighting systems;
- Prevent PFAS from entering the environment;
- Ensure that the foam transition and cleaning are only needed once.

FRAMEWORKS

The frameworks apply to five points. First, the cleaning process must be validated, meaning it must be demonstrably effective. Cleaners can demonstrate this through a long-term analysis of PFAS values in the firefighting system before and after cleaning. It can also be done by comparing the cleaning process with cleaning using methanol. If the cleaning solution is more effective than methanol, it is demonstrably effective.

Second, the scope and initial data must be determined. This concerns, for example, the size of the firefighting system and the type of fluorinated foam that was used. Third, the cleaning process must be designed to be safe and effective. Fourth, there are frameworks for sampling and analysing. Finally, there are frameworks for the handling and disposal of waste materials.

The functional and performance requirements

for the process of cleaning PFAS elements in foam firefighting systems are based on best practices. These best practices are defined in the specific certification programme within the TIC framework – scheme K21045.

SCOPE OF APPLICATION

The guideline focuses on cleaning processes for the following foam-containing installations:

- Stationary fire protection systems on sites and in buildings (including tunnels);
- Fixed systems on mobile firefighting installations such as fire trucks and other compatible firefighting equipment;
- Automatic sprinkler installations.

The guideline does not apply to handheld extinguishers and firefighting systems on ships.

CONCENTRATION LEVELS

The guideline does not set standards for PFAS in

firefighting foam. Instead, it refers to standards established by the European Commission. If the EU or member states set other standards or guidelines, these automatically apply to this guideline. For determining PFAS values before and after cleaning, samples are analysed by a certified laboratory.

Currently, there is limited research data available on the long-term effects of cleaning and any potential increase in PFAS values over time. Therefore, part of the guideline requires cleaners to collect data from cleaning projects and place it in a long-term perspective.

CERTIFICATION OF CLEANERS

This guideline certifies organisations that offer cleaning services. The organisation must apply for certification with Kiwa. Kiwa conducts audits and issues certificates upon approval. The certification scheme is determined by the Fire Safety Expert Council and validated and managed by Kiwa as an independent certification body.

The guideline has been developed in the Netherlands but can be applied in all countries that legally recognise such instruments developed and implemented in a commercial market with organisations possessing solid quality management systems. Authorities participated in the development of the guideline in the Netherlands have agreed with Kiwa's certification model.

PROJECT SCOPE LIMITATIONS

Within this specific certification programme, components of the firefighting system that do not contain foam are not typically included within the scope of the cleaning project. The customer decides whether to clean these pipes based on their own risk assessment and in consultation with third parties such as authorities and insurers. Before the cleaning project begins, the scope must be clearly defined in a plan of approach. A guidance document (connected to the standard) will be developed, based on case studies, to provide the market with guidance on determining the scope.

MANDATORY OR NOT

The guideline was developed by Kappetijn in collaboration with service providers, industry representatives, authorities, and other experts. It is not a mandatory legal framework but can be used voluntarily as a best-practice standard. Customers with firefighting systems that need cleaning have the option to conduct the cleaning themselves or engage a provider that is not certified under this guideline.

The advantage of the guideline is that it provides guidance and assurance during the foam transition. Many organisations are still searching for specific ways to implement the foam transition. Given recent

news reports from the Netherlands about misconduct in the chemical cleaning industry, a BRL that guarantees a safe, risk-resistant, cost-effective, and high-quality cleaning process is highly valuable.

But most importantly, the cleaning process must responsibly remove and dispose of PFAS. organisations with firefighting installations first dispose of the majority of PFAS-containing SVM, and the remaining amount is then disposed of through the cleaning process. There is visibility on waste streams, and firefighting systems (both fixed and mobile) can potentially be reactivated with new, fluorine-free foam. This goal should be kept in mind by both the industry and regulatory authorities.

IMPLEMENTATION

The guideline, SCP10 document, is published in the fall of 2024 on the Kiwa website and is part of K21045 Fire Protection Systems from Kiwa NCP. organisations can submit applications for certification.

BY KAPPETIJN AND KIWA

Kappetijn Safety Specialists is an independent consultancy for safety issues in emergency response and industrial firefighting, including foam transitions and other consequences of fluorinated foam in industry and society.

Kiwa is a certification organisation that inspects and certifies companies to ensure the health and safety of people and environment through quality processes.

DAVID PRONK (KSS)
Consultant,
Kappetijn Safety Specialists

PETER VOSHOL (KIWA)
Business Development Manager,
Kiwa Fire Safety & Security Certification