

RISK ENGINEERING GUIDELINE

IMPAIRMENT OF FIRE PROTECTION SYSTEMS

HDI Risk Consulting

Property

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An impairment of fire protection systems increases the risk. In order to reduce the risk of fire during the impairment of fire protection systems, additional fire prevention measures must be taken.



General.

Fire protection systems, such as automatic fire extinguishing systems and automatic fire alarm systems, are essential components of fire protection concepts. They also provide a high success rate in extinguishing and/or detecting fires. Multiple examples of losses show that companies without adequate fixed fire protection in place often suffer a total fire loss with high property damage and business interruption claims.

The efficiency and reliability of fixed fire protection is thus an essential factor to reduce potential fire damage and to maintain the business continuity of a company. In order to guarantee this to a maximum extent, repair works, periodic

servicing and corrective maintenance to the fire protection systems cannot be avoided. Important: During an impairment, the risk of having a loss increases mainly because of two reasons: Firstly, the fire protection systems that are relevant for the safety are not in operation. Secondly, repair works include activities that increase the risk of starting a fire.

Proactive planning of the impairment plays an important role to ensure that servicing, maintenance and repair works are carried out properly as well to restore the fire protection system immediately after the works have been completed. This guarantees that the work can be carried out as smoothly as possible and that the fire protection system is again operational as quickly as possible.



For this reason, it makes sense to subdivide the measures for the impairment of fire protection systems as follows:

- Measures **before** the impairment.
- Measures **during** the impairment.
- Measures **after** the impairment/restoration of the fire protection system.

1 Risk situation.

Based on experience, the majority of losses happen outside of the “normal” operations. Why is the risk for a company increased specifically during repair, service and maintenance works? The reason is given by the fact that the adequate protection level is not provided and that activities can therefore be carried out outside everyday operations. Additionally, repair and service works often involve activities with an increased accident risk or ignition potential, such as welding, separating and cutting.

In order to reduce the risk of fire during the impairment of fire protection systems, additional fire prevention measures must be taken.

2 Measures before the impairment.

Servicing, repair and maintenance works should be carried out by a certified contractor; preferably by the company that originally installed the fire protection system. The servicing company must be certified for the systems concerned.

Basically, the planned impairment should be reported to HDI Global SE/broker at least 14 days before the start and any compensation measures required are to be clarified. (Attached form “Impairment notification”). Unplanned interruptions (disruptions) are to be reported without any delay. If an unplanned impairment should occur during the night, HDI Global SE/broker is to be informed on the following day. This obligation to inform does not apply if it concerns the impairment of e. g. a single automatic fire detector – under the condition that monitoring of the area involved is not compromised.

The impairment can only be instructed by an employee familiar with the areas and their associated risks and hazards. This should be closely coordinated with the fire safety officer. The instruction should be given in written form and after the impairment, the document is to be kept on file for at least half a year.

The wide variety of varying fire protection systems makes it difficult to be very detailed with respect to all measures to be taken during an impairment. This is why the following list of items does not pretend to be complete and should be adopted or extended to the respective fire protection system when required. Furthermore, reference is made to the relevant sections in the various internationally recognised guidelines to ensure the operational readiness, preventive measures and standard operating procedures are adhered to if a system is not fully operational.





The following should be considered before the impairment:

- Optimal preparation and organisation of the activities, in order to keep the impairment as short as possible. This includes, among others:
 - the setting up of a time schedule,
 - the provision of all required materials (e. g. replacement parts, seals etc.),
 - the coordination of required specialised staff,
 - the avoidance of work interruptions, e. g. of repair works during night-time periods, week ends or public holidays.
- Definition of the areas to be impaired:
 - restriction to small sections if possible,
 - no general impairment of the entire system.If work is being carried out on the pipework of an extinguishing system, only the respectively affected section should be shut off. If the zone protected by one section covers several rooms, appropriate measures should be taken, e. g. by insertion of blind flanges, protective caps, etc., to isolate the pipework only in the rooms where the work is being carried out.
- When work is being carried out on the water supply of (e. g. a sprinkler system), one source of water should be kept operational (compressed air water tank or pump) whenever possible or an alternative feed should be established.
- When the only water supply for an extinguishing system is shut down or fails, an alternative water supply should be provided. If the system is equipped with a fire department connection, a hose connection should be set up between this connection and the next hydrant, integrating a booster pump if necessary.
- Provision of suitable substitute systems (e. g. mobile fire alarm systems).
- Provision of suitable manual fire extinguishing equipment (fire extinguishers, installation of fire hoses ready for use, etc.) combined with a fire watch, or at least an increased number of patrols, e. g. by guards.
- Before a system is partially or completely impaired, all parts of the company site should be inspected in order to ensure that there are no hazards or signs of a fire.

- If on a site with multiple users a common fire protection system is operated, all the users must be informed about the impairment of the system and joint compensation measures should be taken.
- Notification of the responsible public fire brigade and the works fire brigade.
- Notification of the employees, the plant management and the internal security/safety management.
- Any work that involves a fire hazard, e. g. welding, cutting and burning operations, may not be carried out in the areas affected by the impairment or may only be carried out with strict adherence for the applicable safety regulations for operations involving fire hazards (see HDI Risk Consulting Guideline “Hot works” and “Hot work permit”).
- In order to be able to respond at short notice in case of an unforeseen impairment of fire protection systems, detailed procedures should be elaborated in advance. These are then immediately available whenever required.

If fire alarm and extinguishing systems are a safety-relevant element of the building permit and the occupancy permit, this permit for use could be restricted in principle by this impairment. Additional protective measures defined by the responsible authority (e. g. fire protection service department) may have to be taken into account.





3 Measures during the impairment.

The following should be considered during the impairment of fire protection systems:

- Affixing of warning notices in protected areas and on components of the system, clearly indicating that the fire protection system is under impairment.
- Fire protection barriers, such as fireproof doors and fireproof dampers, should be closed during the impairment.
- Hazardous or critical processes representing a fire risk should be discontinued to the maximum extent possible.
- A fire watch should be provided, if possible by the fire brigade or a specialist fire protection company with appropriate communication equipment (radio links, mobile phones), in order to ensure that any fire alarm can be reported without any delay. If longer interruptions of the work are unavoidable, patrols should be carried out at intervals of maximum one hour. These patrols should be documented.
- The design concentration of an oxygen reduction system may not be exceeded during the impairment of the system. Otherwise, the emergency concept agreed with the departments responsible for fire protection and personal safety security must be implemented (e. g. external supply with inert gas from a tanker).

- Smoking and open flames are strictly prohibited in the affected areas (avoidance of unnecessary ignition sources).
- An increased number of control rounds must be carried out by trained and informed guards.
- The use of third party companies within the affected area should be avoided. If the use of third party companies is unavoidable, they must be properly informed and trained in accordance with the situation.
- If possible, the electrical power supply to the affected areas should be switched off.



■ Impairment notification
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■ Restoration notification

To be sent to the insurer/where applicable through your broker

Company name: _____
 Responsible person: _____
 Street: _____ Postal code, City: _____
 Policy number: _____

Herewith we declare that the

<input type="checkbox"/> Sprinkler system	<input type="checkbox"/> Water spray extinguishing system	<input type="checkbox"/> Automatic fire detection system
<input type="checkbox"/> Foam extinguishing system	<input type="checkbox"/> Spark extinguishing system	<input type="checkbox"/> Water-mist extinguishing system
<input type="checkbox"/> Local application extinguishing system, type: _____	<input type="checkbox"/> Gas extinguishing system, gas type: _____	<input type="checkbox"/> Powder extinguishing system
<input type="checkbox"/> Gas extinguishing system, gas type: _____	<input type="checkbox"/> Oxygen reduction system	<input type="checkbox"/>

will be under impairment on _____ 201____ for the estimated duration of _____ hours/days.
 is under impairment since _____ 201____
 The restoration of the system will probably follow within _____ hours/days.
 is restored on _____ 201____ at _____ h.
 The target value of ____ % rest O₂ of the oxygen reduction system will be reached on _____ 201____ at _____ h.

Reason for the impairment:

Extension/Change Repair works Maintenance Damage Other _____

The following area is affected (please mention alarm valve, group, number of sprinklers, area, etc.): _____

Precautions for the impairment:

<input type="checkbox"/> Production processes with an increased fire risk are suspended <input type="checkbox"/> A ban on cutting and welding is valid for the duration of the impairment <input type="checkbox"/> Closed valves are marked <input type="checkbox"/> A person is posted at the control valve/pump for fast reaction in case of a fire <input type="checkbox"/> A smoking ban is valid in the area concerned <input type="checkbox"/> The public fire brigade is informed <input type="checkbox"/> The works fire brigade is informed <input type="checkbox"/> Steps, blind flanges or similar spare parts are available on the spot <input type="checkbox"/> Ordered works are done without interruption Remark: _____ Date, Signature: _____	<input type="checkbox"/> The area under impairment is kept as small as possible <input type="checkbox"/> Fire doors and fire dampers are closed <input type="checkbox"/> Appropriate alternative systems are put in place (e. g. mobile fire detection system) <input type="checkbox"/> A fire watch is arranged <input type="checkbox"/> Pressurised fire hoses are ready for use <input type="checkbox"/> An emergency concept (e. g. external supply of N ₂ for oxygen reduction systems, drains of the sprinkler system connected via a fire hose with a hydrant) <input type="checkbox"/> Other: _____
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Precautions for the restoration:

<input type="checkbox"/> All armatures, switches on (automatic) operational readiness are checked and possibly padlocked in open position <input type="checkbox"/> The pipes are all flushed after the works, a flush test was performed <input type="checkbox"/> Pressure testing was done <input type="checkbox"/> Warning signs indicating the impairment, as e. g. the marking of closed valves, are removed Remark: _____ Date, Signature: _____	<input type="checkbox"/> All parties involved in the process are informed (employees, safety organisation, public and private fire brigade, insurer/broker, etc.) <input type="checkbox"/> The alarm system was reset and the alarm receiving station informed <input type="checkbox"/> The full operational readiness of the system is confirmed in written by the company doing the activities needed during the impairment <input type="checkbox"/> The activities were recorded in the service manual <input type="checkbox"/> Other: _____
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Further explanations and examples of protection measures are listed in the Risk Engineering Guideline "Impairment of fire protection systems" published by HDI Risk Consulting.

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4 Measures after the impairment.

Ensuring complete automatic operational readiness without delay should include the following:

- Check of all fittings and switches for (automatic) operational readiness, if necessary securing in open/closed position with a pad-lock.
- Performing a flushing test at the riser of a sprinkler system.
- Notification of all departments involved in the process (employees, safety organization, public fire brigade or works fire brigade etc.).
- Resetting the fire alarm control panel and notification of the alarm receiving station.
- After the work has been completed, the full operational readiness of the system should be confirmed in writing by the specialist company carrying out the works. Furthermore, the activities should also be recorded in the logbook of the system.

- Notification of HDI Global SE/broker and – if necessary – the responsible public fire brigade and/or building permit authority about the restoration of the fire protection system.
- Removal of the warning notices.

If fire protection systems are under impairment, the risk of a major loss is increased, but can be reduced to an acceptable level by adopting the measures described above.

5 Note.

This Risk Engineering Guideline is not intended to be complete and does not provide any release from the duty of compliance with statutory or legal regulations. Any liability is excluded.



6 References.

Local Standards should be complied with.

VdS 2091en Maintenance of operational readiness of water extinguishing systems

VdS 2093en CO₂-fire extinguishing systems, planning and installation

VdS 2095en Automatic fire detection and fire alarm systems, planning and installation

VdS 2106en Spark detection, spark separation and spark extinguishing systems, planning and installation

VdS 2108en Foam extinguishing systems, planning and installation

VdS 2109en Water spray systems, planning and installation

VdS 2212en Log book for water extinguishing systems

VdS 2240en Log book for gas and powder extinguishing systems

VdS 2304en Local application protection for electric and electronic equipment, planning and installation

VdS 2380en Fire extinguishing systems using non-liquefied inert gases, planning and installation

VdS 2381en Fire extinguishing systems using halocarbon gases, planning and installation

VdS 2496en Triggering of fire extinguishing systems, guidelines

VdS 2893en Maintenance of operational readiness of fire extinguishing systems with gaseous extinguishing agents

VdS 3527en Inerting and oxygen reduction systems, planning and installation

VdS CEA 4001en Sprinkler systems, planning and installation

NFPA 25 Standard for the inspection, testing, and maintenance of water-based fire protection systems



About HDI Risk Consulting.

HDI Risk Consulting GmbH supports major corporations, industrial and mid-size companies with loss prevention and in establishing risk management systems.

HDI Risk Consulting offers its' customers access to some 180 engineers and experts from a wide range of technical disciplines. We aim to support companies with the management of risks and the development of individual risk-based concepts for insurance cover.

HDI Risk Consulting operates globally in the Property, Motor, Engineering and Marine markets, with particular focus on the identification and assessment of risks and the development of appropriate, individual protection concepts.

HDI Risk Consulting GmbH is a wholly owned subsidiary of HDI Global SE.

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