

Fire Protection of Data Centers

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Royal HaskoningDHV

- International team
- Independent
- Innovative

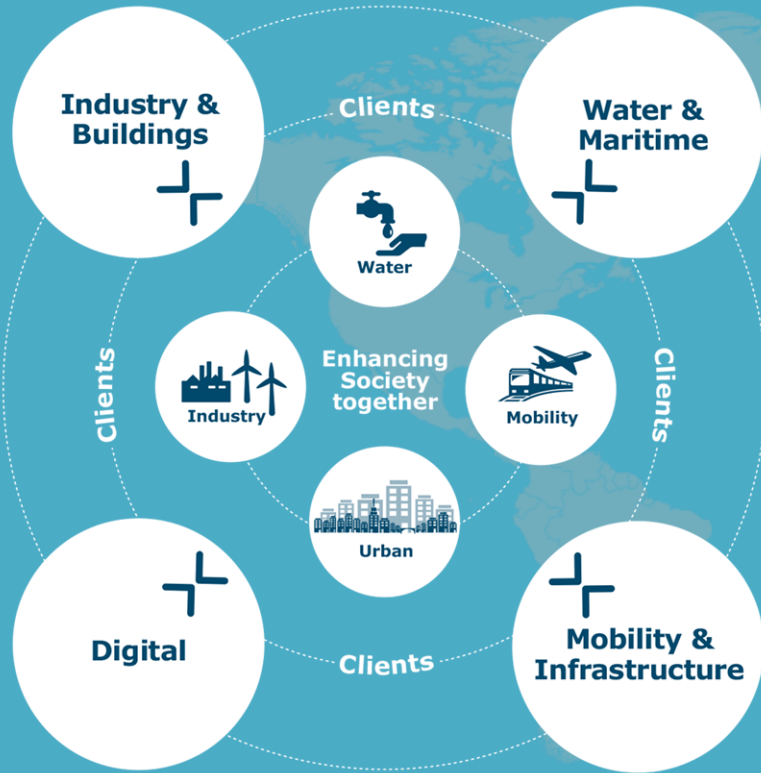
140
jaar ervaring

6000+
medewerkers

140+
landen



Royal Haskoning



Global growth of Data Centers market

- Data Center market revenue grew from US\$250 billion in 2016, to US\$ 342 bn in 2023
- More than 2600 Data Centers are located in Europe.
- The primary markets in Western Europe are related to the locations of the financial markets: Frankfurt, London, Amsterdam and Paris.

Source: Prescient & Strategic Intelligence – market research, <https://www.statista.com>, <https://www.datacentermap.com>

- RHDHV is actively involved in the development of the Data Centre market.

We help our clients across the world from the earliest stages of design, to the completion of the construction and commissioning process.



Fastest
growing market →

North America

Europe

APAC

LATAM

MEA

Evolving trends in Fire Protection of Data Centers

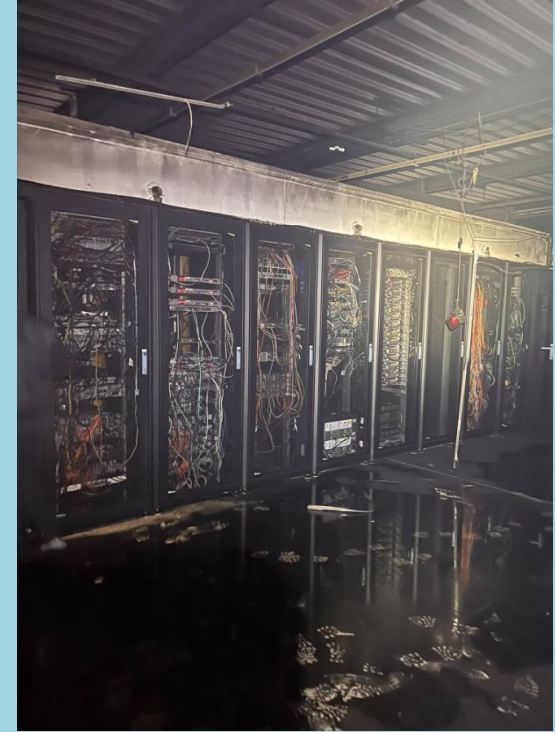


What is a real risk for the Data Center from the client perspective?
Is it indeed a fire, or the possible water damage?



- Very early detection aspirating systems became, a universal method of fire detection in critical areas of the data centers.
- With time and experience gained, preferences for fire suppression methods have changed

From 2016 to 2022, there was **16** records of publicly reported outages caused by fire in the Data Centers.



Flexibility with local regulations...

GERMANY

- Brandschutzkonzept (*eng. Fire concept*)
- Coordination with Local Fire Brigades (f.e. BOS) and city authorities
- Inspection authorities (f.e. TUV)

SWITZERLAND

- Der Verband Schweizerischer Errichter von Sicherheitsanlagen SES (*eng. The Association of Swiss Installers of Security Systems SES*)
- Tender submission - SIA41, SIA51
- Vorabklärung (*eng. Preclarification*)

SOUTH AFRICA

- British Standards
- Low availability of equipment and/or materials



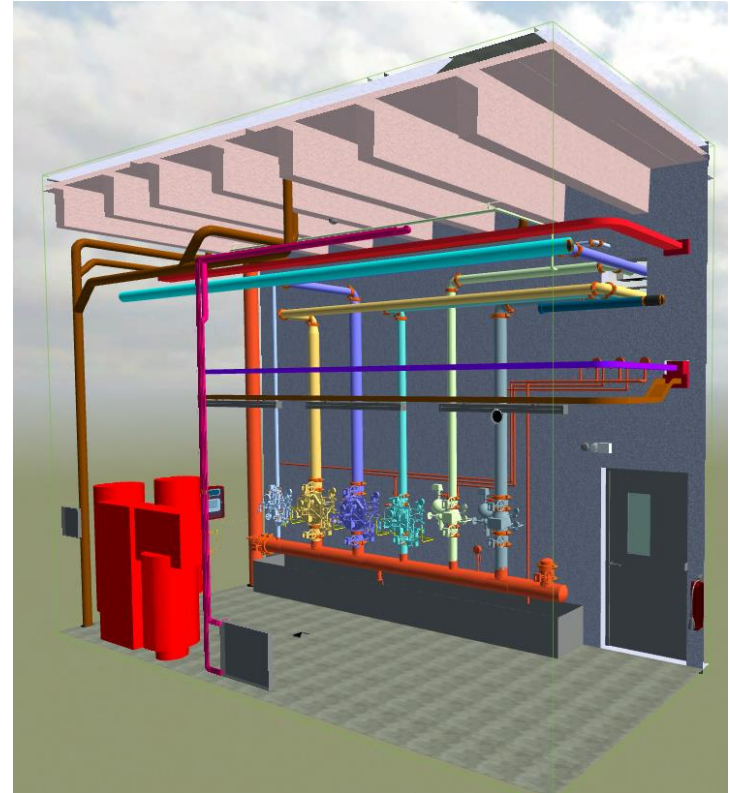
... and client's requirements

Most of the DC owners have a basic list of their own requirements:

- Fire Protection Standard to implement;
- Fire suppression system type;
- Fire detection type;
- System(s) redundancy;

However, some of our clients share the extended list.
For example:

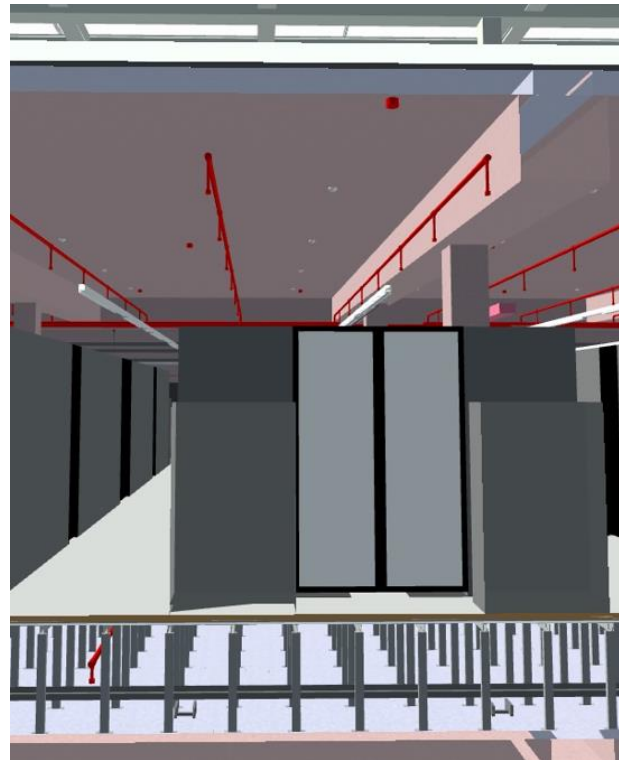
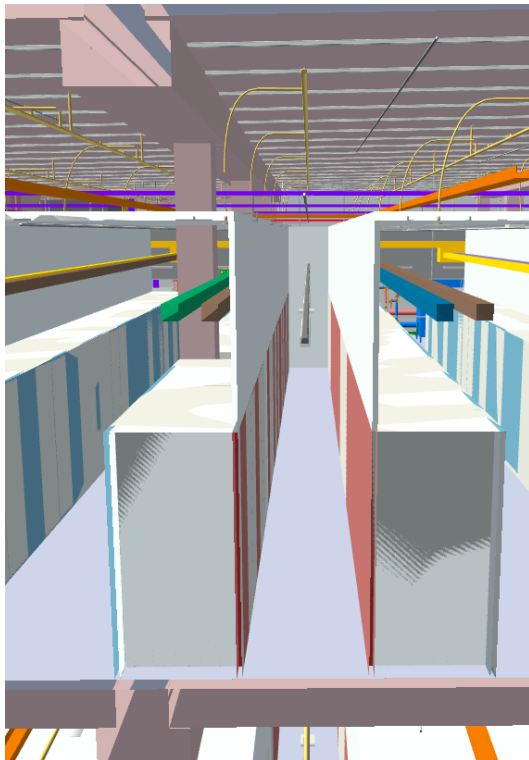
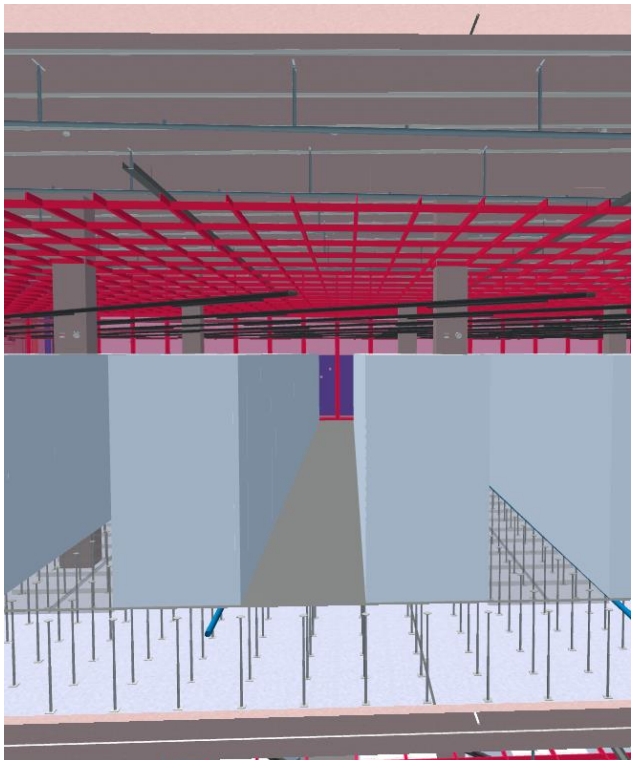
- Type of the suppression system supply;
- Expected sprinkler head temperature rating;
- Double (or triple) interlock preaction system in critical spaces;
- Stand-alone installations for containerized units, etc.



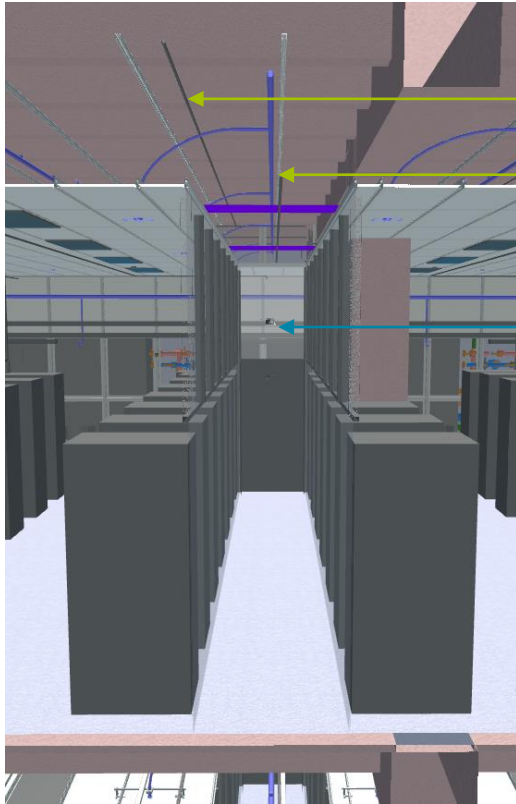
Different type of Data Centers



Different types of Data Halls



Fire detection and protection in Data Hall



ASD system on the ceiling level

ASD system in the hot aisle

ASD system in the cold aisle

FA indicators in each cold/hot aisle

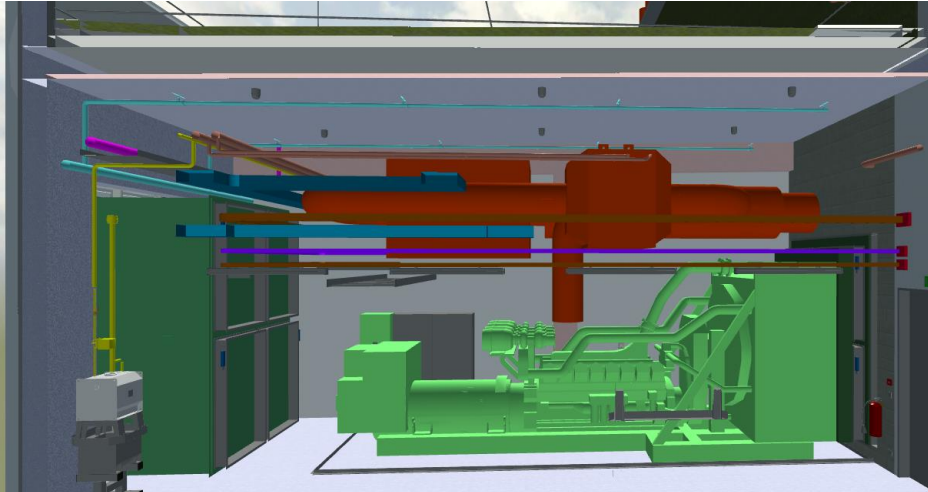
Dedicated suppression zone for each DH

Double interlock pre-action system (EL/PN)..

Fire Extinguishers

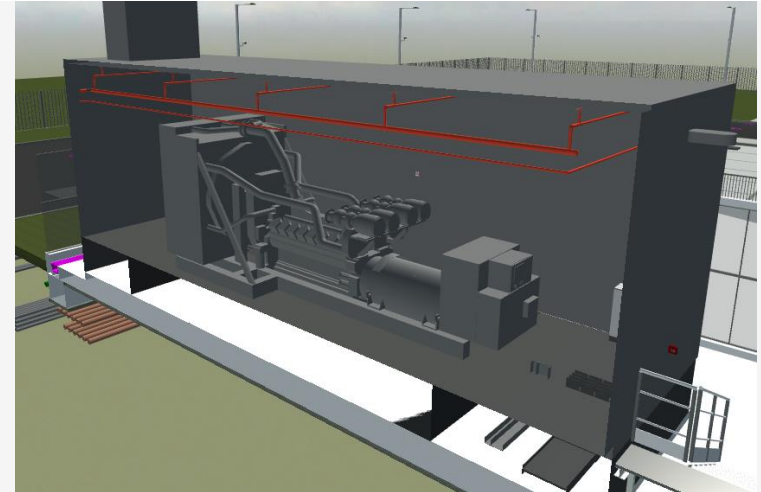
Fire detection and protection of Generators

Generator inside the building



- Critical part of Data Center FP installation
- Heat detectors
- Fire extinguishers located inside the room
- Located in dedicated building or 90 min fire rated room

Gen-set unit inside the container



- Preferred stand-alone systems able to “communicate” with Data Center building systems
- Flame detectors
- Fire indicators and extinguishers located outside the gen-set
- Issues with proper Fire Rating

Fire detection and protection in Storage areas

- Storage rooms are usually 4,2m – 6m height;
- Sometimes, clients expect the dry sprinkler system to be installed in this space;
- Clients often do not want to have any limitations on what their tenants can, and can not keep in the dedicated storage rooms;
- The information about what will be kept in the storage is not shared with the engineering team.



Fire detection and protection in Battery (storage) rooms



To protect battery room correctly, a few major items must be indicated:

- Is it live-battery room or battery storage?
- What type of batteries are used / stored?
- If the room is dedicated to store batteries, are they new, used or damaged?
- Does the Fire standard provide requirements for such a situation?

Development and trends on the market

- Fire protection of Li-Ion based rack servers;
- Sustainability of the Data Centers and their components;
- Impact of environmental polices;
- Implementation of new technologies.

