

COPE Report Nicolaas Bloembergengebouw

Adress: Padualaan 12, Utrecht

Report of

Participants:

Wout Jan Weide date of visit 11/04/2024

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Introduction:

The University of Utrecht was visited April 11th, 2024 for a survey to get an impression of the exposures and controls. The building has a special use by means of various NMR's. NMR stands for Nuclear magnetic resonance is a physical phenomenon in which nuclei in a strong constant magnetic field are perturbed by a weak oscillating magnetic field and respond by producing an electromagnetic signal with a frequency characteristic of the magnetic field at the nucleus.

Number of stories: 2 Year built: 1FR construction. The990

(Main) NIACs Code: 611311 A property class 6

OCCUPATION:

In total there are nine NMR's in this building, 4 smaller (older) types in one room and 5 larger newer types in the larger room. The larger room represents about 80 % of the total insured value of this building. Beside the two laboratory rooms there are also some utility rooms present with technical equipment to support the process (air treatment systems, power supply, Helium recycle system etc.) All these NMR's are located at ground floor level. The second floor level is in use for some offices and a canteen. The strongest NMR in the world is located at this site (with a magnet of 28 Tesla). This system had a construction time of about 4 years.

CONSTRUCTION:

The building has a FR construction (heavy concrete). The total building is made of heavy concrete also to protect the equipment from vibrations and magnetic influences from the outside and to protect the outside from the magnetic fields. The office section might have some steel construction parts but as the high value is concentrated in the FR construction the overall construction is classified as FR.

Chubb Fire Construction Class: FR (100%)

Internal combustible panels: None

External combustible panels: None

Superior Protected Risk: No

LOSS ESTIMATES:

Bloembergenbuilding.

	PD	BI over 36 months
TIV (Three buildings together)	€ 70.198.000	€ 50.000.000,- (extra expenses)
Amount Subject	100 %	20 %
PML	80%	50 %
NLE	80 %	50 %

The NMR's are spread over two rooms that are 60 minutes fire retardant separated from each other (two heavy concrete walls, both rooms are closed by normal doors (that will have a smoke retardant function) but also a 60 minutes fire retardant sliding door to separate the two area's from each other. As the fire load in the research rooms is relatively low it is a theoretical approach to expect that the total building will be lost.

As the measurements done by the NRM's are very accurate the equipment is vulnerable for smoke and soot damage. Therefore under a realistic condition it can be expected that the fire is limited to a single room but all equipment might be damaged and might need to be replaced by new ones. Under PML and NLE conditions it is expected that the largest room will be contaminated. Some of the NMR's have a replacement time of four years. The equipment is quite standard however the systems are custom build on customers specifications (with accessories specified by builder and client). The smaller systems have a shorter delivery time.

Water supplies for firefighting:	AAA	Fire brigade	AAA
Management Controls	AAA	Risk Alert	No
% of location sprinkled	0	% of location requiring sprinkler	0
Chubb grade Serious Deficiency	No		
Smoke detectors	AAA		
Burglary alarm	AA		
RPF other factors	none		

PROTECTION:

The water supply is by means of underground hydrants good. The public professional fire brigade arrives in 10 minutes. The fire alarm is directly forwarded to the central station. The buildings are provided with fire detection in combination with compartmentalization. The fire brigade is instructed that they are not allowed to bring any steel parts into the building. Extinguishers are made of aluminium (nonmagnetic). The compartmentalisation is classified adequate, especially in relation to the fire load, but it has to be mentioned that about 80 % of the value is located in a single room. According to the "university fire directive" automatic sprinklers should be considered, however this is not applicable for this building. The fire load is in general so low that sprinklers would not be activated (or too late). Aspiration detection, compartmentalisation and fast alarm follow up provides a better protection. Therefore the present protection is classified adequate.

A burglary alarm system is installed. Alarm follow up is done by a security service with the station around the corner (less than 1 minute drive). The building has also a good entrance control system. Only a limited number of students and staff are allowed in this building.

Evaluation of Exposures:

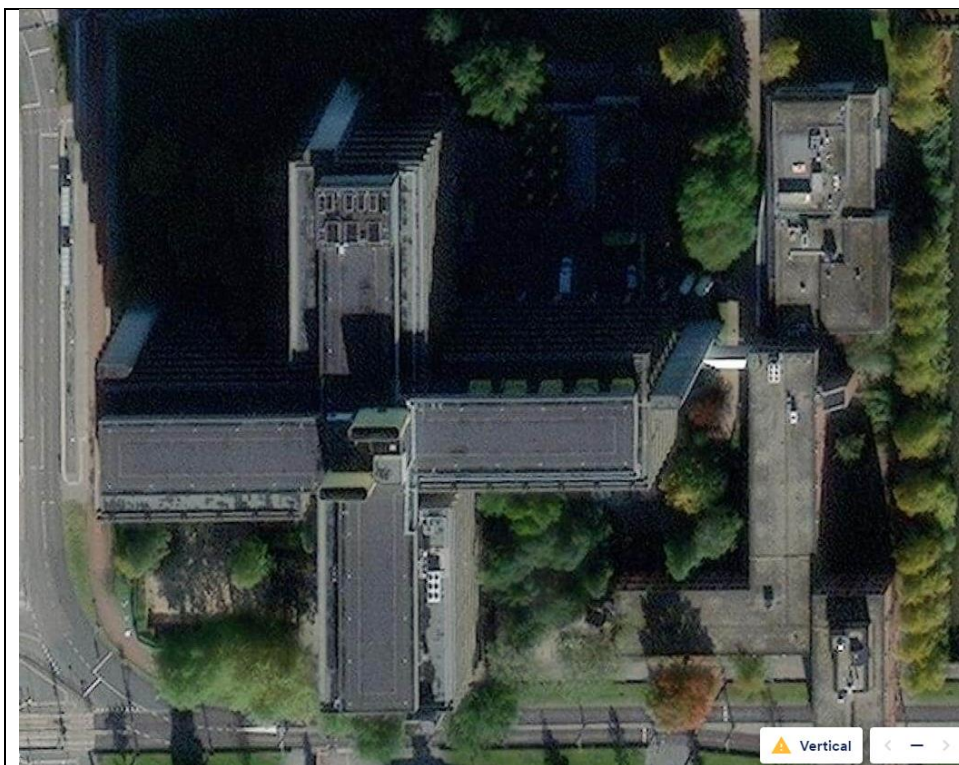
Helium: Helium is a non-combustible gas that is used for cooling and prevent quenching of the NMR. The gas is expensive but not hazardous (for fire or explosion). Helium spills are collected in a kind of balloon in the NMR room and via a pumping device recycled for re-use. This process is adequate controlled.

Coffee machines:

Fire hazards: The fire hazards are limited to the electrical installation. The electrical installation is checked in accordance with the local standards NEN 3140 including infrared scanning. The cable penetrations are properly sealed off by a specialized contractor. Most probably smoke and soot can result into faulty measurements by these very accurate systems. Therefore, even after a limited fire loss the contamination might result into very high replacement / cleaning costs.

Water damage: The coffee machines are connected to the tap water system without a water lock (see rec.). The NMR's are all located elevated from the floors and therefore no large claims are to be expected.

Next door buildings: The bloembergenbuilding is interconnected with the Sjoerd Groenmanbuilding that is located at 2 meters distance and interconnected by a single storey corridor that is 60 minutes fire retardant separated. From the Sjoerd Groenmanbuilding there is a non-combustible corridor (single floor) to the Kruytbld (a single 60 minutes fire retardant partition).



Overview of the buildings. Left: Kruytbld, right top: Bloembergen, right bottom: Sjoerd Groenman

Overall a fair risk but after improving the housekeeping (remove combustibles from the NMR-rooms an acceptable risk.



The larger NMR-room



The larger NMR-room



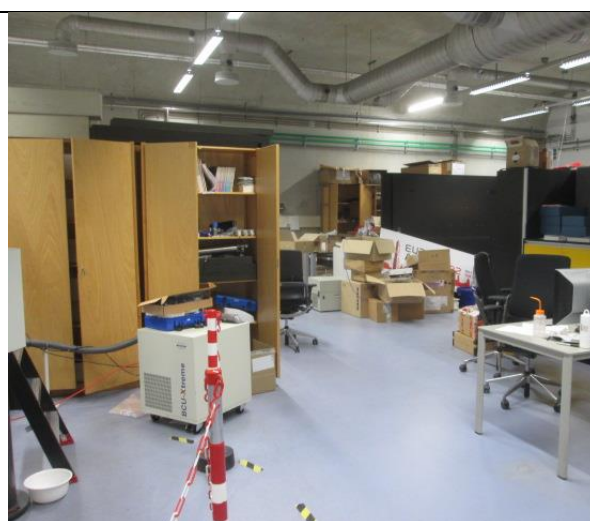
Plan: at the right the large NMR-room in the middle the smaller room



The larger NMR room



The NMR's are mostly elevated from the floors.



The smaller NMR-room



Excessive storage in the smaller NMR-room



An old, cut open NMR



No water supply for the coffee machines



Antimagnetic extinguishers (Aluminium)

AANBEVELINGEN:

2024-01 Huishouding

De huishouding schiet op enkele plekken te kort. Zo wordt brandbaar materiaal nabij de NMR's gestald en is er nagenoeg geen opslagruimte beschikbaar. Bij (kostbare) technische installaties willen we altijd voorkomen dan een onverhoopte brand door de aanwezigheid van vuurlast onnodig groot en onbeheersbaar wordt. Nabij de NMR's is brandbare opslag aangetroffen, in de grote ruimte was dit nog enigszins beperkt, maar in de kleinere NMR-ruimte was dit duidelijk te veel. Dringend wordt aanbevolen om alle brandbare opslag uit NMR-ruimtes en andere technische ruimtes te verwijderen om het brandrisico op een aanvaardbaar niveau te brengen.

2024-02 Watersloten

Koffieautomaten zijn op de waterleiding aangesloten via een kunststof slangetje. Watersloten zijn niet geïnstalleerd. Na verloop van tijd kan de slang open barsten en kan water onbeperkt uitstromen en voor een grote waterschade zorgen. Om een dergelijke schade te voorkomen worden watersloten aanbevolen waarbij getoetst moet worden of het waterslot na een slangbreuk van de toegepaste (dunne) slang ook daadwerkelijk dicht gaat. Indien dit niet het geval is dient een ander type slang gebruikt te worden.