Risk Engineering Report

Prepared for:

N.V. VERZEKERINGSBEDRIJF GROOT AMSTERDAM (VGA)

Site Name:	GVB Remise Havenstraat
Date of Survey:	December 17, 2021
Report Date:	January 4, 2022
Survey Type:	Property All Risk - Initial
TIV (EUR):	36,738,394
Site Address:	Havenstraat 18 t m 24, Havenstraat 18, AMSTERDAM, 1075 PR, Netherlands
Latitude:	52.348934
Longitude:	4.854479
RFS ID:	RFS-87337
SIC Code:	3743-01-Manufacture of Railroad Equipment

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Support Services

Client Resources:

We maintain a library of over 300 documents, forms and other resources created specifically for client use:

- Hot work permits
- Impairment tags
- “Insights”, a collection of risk related topics
- Tip Sheets, lists to use in preparing for extreme weather events

Ask your local risk engineer for access or email requests to globalproperty.impairment@aig.com.

Impairment Hotline:

To report sprinkler system, fire pump, water supply or other fire protection outages at insured facilities:
Call us at +1 877-705-7287 or +1 817-490-3255 or
Email us at globalproperty.impairment@aig.com

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Purpose of Visit

This facility was visited to undertake a risk assessment of the fire and associated perils for insurance purposes. The purpose of the assessment was to assist in the identification and mitigation of hazards and exposures that could lead to the loss or damage to assets or business interruption.

Site Overview

Type of Business: The Municipal Transport Company (GVB) of Amsterdam provides public transport in the municipalities of Amsterdam and Diemen and Duivendrecht, which belongs to the municipality of Ouder-Amstel. It also operates three lines in Amstelveen, three lines in the Haarlemmermeer and three ferries across the North Sea Canal. The GVB has three important locations for tram maintenance. In the first place the Hoofdwerkplaats Rail in Diemen. Major maintenance is carried out on trams and metros there. In addition, there are two tram depots in Amsterdam: Havenstraat and Lekstraat. At the Havenstraat location, maintenance and storage of trams takes place. The Lekstraat depot is mainly used for storage and service work. This report is about the Havenstraat location. The depot is located in Amsterdam South, largely surrounded by inhabited areas. It is a vast complex of buildings. The site also has an extensive outdoor parking facility for the trams. In addition, some houses are part of the complex. In addition to parking, maintenance and repair of trams and parts takes place here. Service work also takes place here. Major maintenance takes place in Diemen. Typical activities are the maintenance and replacement of chassis, hull and interior. The workshops have lifting equipment. In addition, workshops have been set up for work on parts. Welding and grinding work is also carried out and spraying work is carried out on a very small scale, not on an industrial scale. The location also has a washing installation.

Terrain:
Surface: approximately 40,000 m2.
Location: Amsterdam South, on the edge of the center.
Adjacent buildings: occupancy on the right is approximately 10 meters. A canal at the back. On the right-hand side, a few meters away, somewhat run-down industrial buildings with various uses. This concerns, for example, romney sheds with all kinds of smaller companies, including car dismantling (car scrapyards).
outdoor storage: unlike the storage of trams, there is no outside storage. On average, about 125 trams are parked at night, 50 of which are indoors.

Buildings Description:
extensive composite building complex, the largest part of which was realized at the beginning of the 20th century (1914-1934). It consists of entrance buildings, workshops, storage rooms, offices, etc. The outdoor parking is partly covered, so it is partly an open building.

Built area: approximately 12,500 m2.
Vertical construction: mainly stone and concrete.

facades: mainly masonry.
Horizontal construction: most steel.

Roofs: diverse. A large part is provided with concrete slabs with no or unknown insulation with bituminous roofing. Smaller parts of the roof, for example above offices, have wooden boarding and PUR or PIR insulation. Skylights are fitted with polycarbonate glazing.
Floor floors: only a small part of the building has upper floors, both wood and concrete.

Site Loss History

No information available at this point in time. No information available related to recent loss history for this site.

New Projects, Significant Changes and Observations

It is important to involve your insurer in new projects, such as refitting, refurbishment, extension work, new builds or relocating to a new site. Failure to do so could result in using non-approved construction materials (even though they meet local Building Codes and Fire Regulations) or inadequately protected facilities which could lead to expensive retrospective additions or rework. The Loss Prevention Engineering team at AIG can assist you with this by providing you with engineering support both before and during your project. Please contact us before you commence your project to ensure that we can arrange a consultation with one of our engineers.

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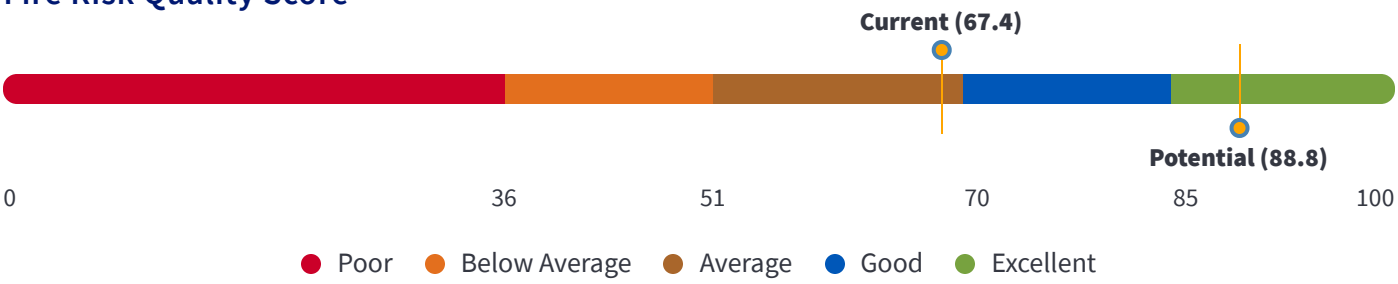
Risk Summary

Open RI by Classification	7
Critical	0
Important	6
Advisory	1

Open RI by Age	7
New	4
Outstanding	3
Completed RI	**0**

Open RI by Type	7
Management Programs	3
Physical Protection	4

Fire Risk Quality Score



Ratings

	Current rating	Potential rating
Hazards	Low	No Deficiencies
Water Supply	Good	Excellent
Protection	Adequate	Good
Management Programs	Nearly Adequate	Good
Supervision	Adequate	Good
Exposures	Slight	Negligible

Risk Improvements

Risk Improvements - Open

Number	**Name**	**Classification**	**LE Before** (EUR)	**LE After** (EUR)
16-12-01	HOT WORK PROGRAM- DEVELOP	Important	--	--
16-12-02	CHARGING BATTERIES	Important	--	--
16-12-03	SPRINKLER ROOM	Important	--	--
21-12-01	CREATE AN INTEGRATED FIRE SAFETY PLAN (Dutch IPB)	Important	--	--
21-12-03	MANAGEMENT OF CHANGE PROCEDURE	Important	--	--
21-12-04	SELF INSPECTION PLAN- DEVELOP	Important	--	--
21-12-02	BUSINESS CONTINUITY PLAN- DEVELOP	Advisory	--	--

Note: Risk Improvements associated with management programs will not have an associated Loss Estimate before or after implementation

Open Risk Improvements : Important

Number/Type	Name	LE Before (EUR)	LE After (EUR)
16-12-01 Management Programs	HOT WORK PROGRAM- DEVELOP		

Summary

Develop and implement a hot work program based on the AIG cutting and welding permit system to monitor hot work operations. The program should including logging and tracking of hot work and pre and post work approvals. The program should also require a continuous fire watch while hot work is being conducted, a 1 hour continuous fire watch after hot work has been completed and a 3 hour intermittent fire watch thereafter.

Details

Improper cutting and welding is a leading cause of fire. Loss history shows that some hot work fires can start some distance away from where the work is taking place, sometimes well after the work has been completed. A hot work permit system ensures that proper precautions are in place prior, during and after this work is completed. All hot work operations taking place outside designated workshop areas should be performed under this program, including work by contractors.

Number/Type	Name	LE Before (EUR)	LE After (EUR)
16-12-02 Physical Protection	CHARGING BATTERIES		

Summary

Charging the battery safely (INDUSTRY AGREEMENT)

Details

A number of points are important in general with regard to battery chargers:
• Do not connect battery chargers via cable reels and, in connection with fire hazard, allow battery chargers to use their own power supply with a permanent connection or directly into a wall socket,
• Battery chargers must be kept free from storage, placement in racks in the vicinity of combustible materials is not permitted and they must be kept clear of 2 meters around,
• Protect battery chargers against possible collisions, placing them on a platform or installing collision protection prevents damage,
• The location of the loading device must be clearly marked,

• When using several forklifts, a separate loading area is recommended,
• During charging of batteries, hydrogen gas is released due to electrolysis of the acid filling, especially during overcharging, and the released gas forms a mixture with air from the room, which is known as oxyhydrogen. This mixture is explosive at a hydrogen concentration in air between 4 and 74%. The lower explosion limit (LEL) of 4% can be reached quickly with poor ventilation. 0.4% is used as a safe limit.
The situation has not yet improved compared to the earlier findings. Please also see the industry agreement on safe battery charging https://www.arbocatalogus-tg.nl/brancheafspraak/veilige-magazijninrichting/veilig-accu-laden/ for reference (Dutch language website reference).

Number/Type	**Name**	**LE Before** (EUR)	**LE After** (EUR)
16-12-03 Physical Protection	SPRINKLER ROOM		

Summary

In the sprinkler room are a few storage barrels of diesel oil. According to the guidelines this is not allowed. However, they are in front of a group box. In the event of a calamity, for example a short circuit, this can cause a fire and have a stimulating effect. Place the barrel of diesel oil outside the room.

Details

In Technical Bulletin 77B 'Pump sets for VBB systems' (TB77B) the requirements for fuel are stated in 11.5. ‘The quality of the fuel to be used must always comply with EN590. There are now also engines in which fuel can be used that complies with NEN-EN 15940:2016 + A12019 + C1:2019. The fuel tank and any storage tanks must be placed in such a way that they are not exposed to direct sunlight (heating) or other heat sources. It also applies that no unnecessarily large amounts of fuel should be stored (no more than volume used in one year during testing).'

Images

Diesel fuel storage in sprinkler room larger than required

Number/Type	Name	LE Before (EUR)	LE After (EUR)
21-12-01 Physical Protection	CREATE AN INTEGRATED FIRE SAFETY PLAN (Dutch IPB)		

Summary

Checks whether the Integrated Fire Safety Plan for this location in its current form is sufficient as a document and is sufficiently clear to everyone. If not, create a new integral fire safety plan that serves as a framework for all principles in relation to fire, such as the emergency response organization, the fire service plan of attack and the Business Continuity Plan (BCP) and the management of change procedure (MoC).

Details

See also https://hetccv.nl/keurmerken/expert/brandbeveiliging/model-integrale-brandveiligheid-bouwwerken/stappenplan/2-het-integraal-plan-brandbeveiliging/ for details.
There are several design principles that are very important when assessing the fire safety of the above complex. The certification of the automatic sprinkler system is essential due to the lack of fire and smoke separations. The principles of the sprinkler design are described in more detail in the PVE. The normative fire scenario within a tram is important in this regard for the maximum spray area on which the sprinkler is calculated. This depends on the time until detection, the development of the fire and the intended firefighting response. Check annually whether the principles still correspond with the current design (the chosen design principles).
Checks whether the Integrated Fire Safety Plan for this location in its current form is sufficient as a document and is sufficiently clear to everyone. If the IPB is missing, consider preparing an IPB as a reference and starting point for all fire related aspects to obtain, maintain and manage the required transparency. If the IPB requires a certified sprinkler installation, it is essential that the installation (Sprinkler) is and remains certified with a “YES” conclusion for the intended use. See also documents 11010_210331_RAPP_Kiwa_01490-0-in2021-01 dated March 31, 2021 and 11010_211027_RAPP_Kiwa_01490-0-in2021-02 dated October 20, 2021 for details. Observation 21-12-06 AUTOMATIC SPRINKLER INSTALLATION – CERTIFICATION also falls directly under this aspect.

Number/Type	Name	LE Before (EUR)	LE After (EUR)
21-12-03 Physical Protection	MANAGEMENT OF CHANGE PROCEDURE		

Summary

Discuss and submit design data for any new project or change that may affect the fire hazard of structures, investments in new equipment, and fire protection systems in a timely manner to VGA for review and approval, preferably prior to project start.

Details

The involvement of VGA (and/or AIG risk engineering) in project studies is the best way to evaluate the potential impact on damage prevention and fire safety. Prevention measures can often be realized considerably cheaper if they are included in the building design at an early stage than after the completion of a construction project.There is still a lack of an overarching procedure within the organization of the GVB location Havenstraat that provides for an integrated assessment of all proposed changes by all involved disciplines (parties that can initiate changes) for impact. A test that assesses the impact of these changes on the fire safety concept. This is on the one hand to maintain the fire safety level in the event of design changes and, on the other hand, to possibly improve it.

Number/Type	**Name**	**LE Before** (EUR)	**LE After** (EUR)
21-12-04 Management Programs	SELF INSPECTION PLAN-DEVELOP		

Summary

Develop and implement a written self inspection plan that requires regular, formal documented fire safety inspections. The plan should establish fire safety and fire equipment and system inspection frequencies and establish checklists for items to be inspected.

Details

Fire safety inspections can identify potential hazardous situations and ensure they are corrected on a continuous basis. Fire equipment and system inspection and testing will help ensure the protection equipment is properly placed, is serviceable and will operate if needed. NFPA 25 contains information on water based fire system inspection and testing. Those assigned plan responsibilities should be trained in its implementation.

Open Risk Improvements : Advisory

Number/Type	Name	LE Before (EUR)	LE After (EUR)
21-12-02 Management Programs	BUSINESS CONTINUITY PLAN-DEVELOP		

Summary

Develop and implement a written business continuity plan (BCP) that identifies and addresses how the facility would respond to all events that could lead to interruption of operations, analyzes the business impact of each of them, and the recovery strategies needed to limit the consequences of the incident. Components of the plan should be tested annually as part of the annual review process. A BCP is critical to ensure the facility can quickly respond to major events and limit their impact on the business. Approximately 50%of businesses that suffer from a major disaster without a BCP never re-open for business. The BCP should address events creating adverse physical conditions including weather and natural hazards such as flood, windstorm and earthquake, fire, loss of critical utilities, and civil disturbances.
Develop and implement a written business continuity plan (BCP) that identifies and addresses how the facility would respond to all events that could lead to interruption of operations, analyzes the business impact of each of them, and the recovery strategies needed to limit the consequences of the incident. Components of the plan should be tested annually as part of the annual review process.

Details

A BCP is critical to ensure the facility can quickly respond to major events and limit their impact on the business. Approximately 50%of businesses that suffer from a major disaster without a BCP never re-open for business. The BCP should address events creating adverse physical conditions including weather and natural hazards such as flood, windstorm and earthquake, fire, loss of critical utilities, and civil disturbances.

Occupancy & Process Overview

Occupancy Details

Building	SIC Code	Description	Operating Days/yr	Operating Hrs/Day	Other Tenants
GVB Remise Havenstraat	374301	Manufacture of Railroad Equipment	365	24	Yes

Construction

Category	Current Rating	Potential Rating	RI's
Construction	ISO 5 / Class A - Modified Fire Resistive	ISO 5 / Class A - Modified Fire Resistive	2

Building	Year Built	# Stories	Height (m.)	Total Area (sq. m.)
GVB Remise Havenstraat	1914	3	12	12,500

Area (1,000 sq. m.)

Building	ISO1/D	ISO2/C	ISO3/C	ISO3/B	ISO4/C	ISO4/B	ISO5/A	ISO6/AA
GVB Remise Havenstraat	--	1.0 (8.00%)	--	--	--	--	11.5 (92.00%)	--
Total	**0.0 (0.00%)**	**1.0 (8.00%)**	**0.0 (0.00%)**	**0.0 (0.00%)**	**0.0 (0.00%)**	**0.0 (0.00%)**	**11.5 (92.00%)**	**0.0 (0.00%)**

Definitions: ISO1=wood frame walls roof, ISO2=masonry walls wood roof, ISO3=light non-combustible walls roof, ISO3 (CMD)=ISO3 with combustible metal deck, ISO4=non-combustible metal deck and masonry walls, ISO4 (CMD)=ISO4 with combustible metal deck, ISO5=modified fire resistive walls roof, ISO6=fire resistive walls roof.

Comments

The building owner could not specify the exact floor area of the building at the time of the survey. A new extension has been built and is in use since last year. It was unknown at the time of the survey what insulation materials has been applied on the roof or has been used in the wall assembly. There is a PV-installation on the roof which reportedly has not been activated or installed in full, reportedly this system is not yet operational. There are some uncertainties related to the building construction file. Some of the buildings date back to 1914 however a major renovation has been done in 1930's and the site is under development since, with small adjustments to the foodprint. The fire prevention and loss protection concept currently has a strong focus on the automatic fire sprinkler system and less so using passive fire protection such as fire walls or smoke barriers.

Risk Improvements

Name	LE Before (EUR)	LE After (EUR)
CREATE AN INTEGRATED FIRE SAFETY PLAN (Dutch IPB) 21-12-01	0	0
MANAGEMENT OF CHANGE PROCEDURE 21-12-03	0	0

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Water Supply & Fire Pumps

Water Supplies

Category	Current Rating	Potential Rating	RI's
Water Supply	Good	Excellent	0

Name	Type	Pump Associated	Adequacy
Municipality fire water	Gridded Municipal	None	Adequate
Sprinkler fire water	Tank or reservoir	Multiple Pumps: All Diesel	Adequate
Secundairy fire water	Pond, River or other static source	None	Adequate

Fire Pumps

Name	Suction source	Driver	Shaft	Start Method
Fire Pump Diesel #1	Tank or reservoir	Diesel Engine	Horizontal Shaft	Auto

Driver approval	Approval listing	Controller approval	Pressure Churn (bar)	Pressure Rated (bar)	Flow Rated (Lpm)	Flow Max (Lpm)	Pressure @ max flow (bar)	Rated speed (rpm)	Pressure tank
OTHER	OTHER	OTHER	8.40	7.50	5,000.00		8.55	1,800.00	No

Tested Date	Tested By
Mar 12, 2021	KIWA

Test point	Flow Measured (Lpm)	Flow Nominal (%)	Flow Corrected (Lpm)	Pressure Suction (bar)	Pressure Discharge (bar)	Pressure Net (bar)	Pressure Corrected (bar)	Speed (rpm)	Rating
Churn	0.00	0.00	0.00	0.00	8.40	08.40	8.54	1,785.00	Not Applicable

Test point	Flow Measured (Lpm)	Flow Nominal (%)	Flow Corrected (Lpm)	Pressure Suction (bar)	Pressure Discharge (bar)	Pressure Net (bar)	Pressure Corrected (bar)	Speed (rpm)	Rating
Test point 1	3,334.00	66.68	3,390.51	0.00	8.10	08.10	8.38	1,770.00	Good
Test point 2	5,000.00	100.00	5,096.26	0.00	7.50	07.50	7.79	1,766.00	Good
Test point 3	6,250.00	125.00	6,399.32	0.00	6.20	06.20	6.50	1,758.00	Good

Name	Suction source	Driver	Shaft	Start Method
Fire Pump Diesel #2	Tank or reservoir	Diesel Engine	Horizontal Shaft	Auto

Driver approval	Approval listing	Controller approval	Pressure Churn (bar)	Pressure Rated (bar)	Flow Rated (Lpm)	Flow Max (Lpm)	Pressure @ max flow (bar)	Rated speed (rpm)	Pressure tank
UL	UL	UL	8.40	7.50	5,000.00		9.52	1,858.00	No

Tested Date	Tested By
Mar 12, 2021	KIWA

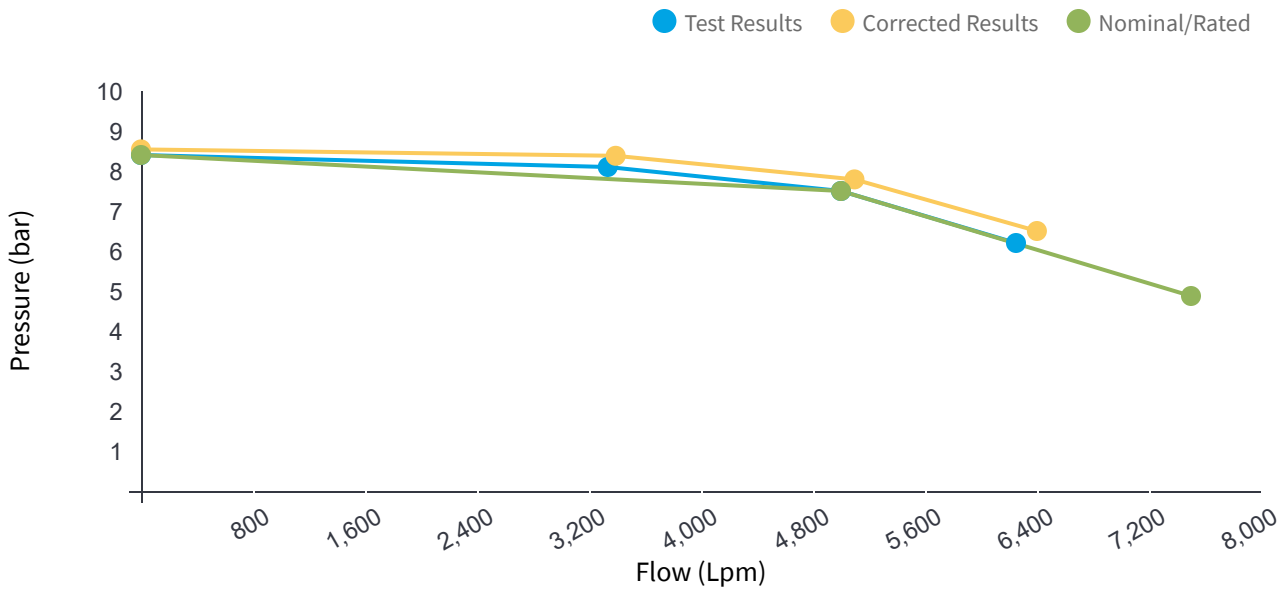
Test point	Flow Measured (Lpm)	Flow Nominal (%)	Flow Corrected (Lpm)	Pressure Suction (bar)	Pressure Discharge (bar)	Pressure Net (bar)	Pressure Corrected (bar)	Speed (rpm)	Rating
Churn	0.00	0.00	0.00	0.00	9.40	09.40	9.40	1,858.00	Not Applicable
Test point 1	3,334.00	66.68	3,426.20	0.00	8.80	08.80	9.29	1,808.00	Good
Test point 2	5,000.00	100.00	5,326.83	0.00	7.50	07.50	8.51	1,744.00	Good

Test point	**Flow Measured** (Lpm)	**Flow Nominal** (%)	**Flow Corrected** (Lpm)	**Pressure Suction** (bar)	**Pressure Discharge** (bar)	**Pressure Net** (bar)	**Pressure Corrected** (bar)	**Speed** (rpm)	**Rating**
Test point 3	6,250.00	125.00	6,932.84	0.00	6.40	06.40	7.87	1,675.00	Good

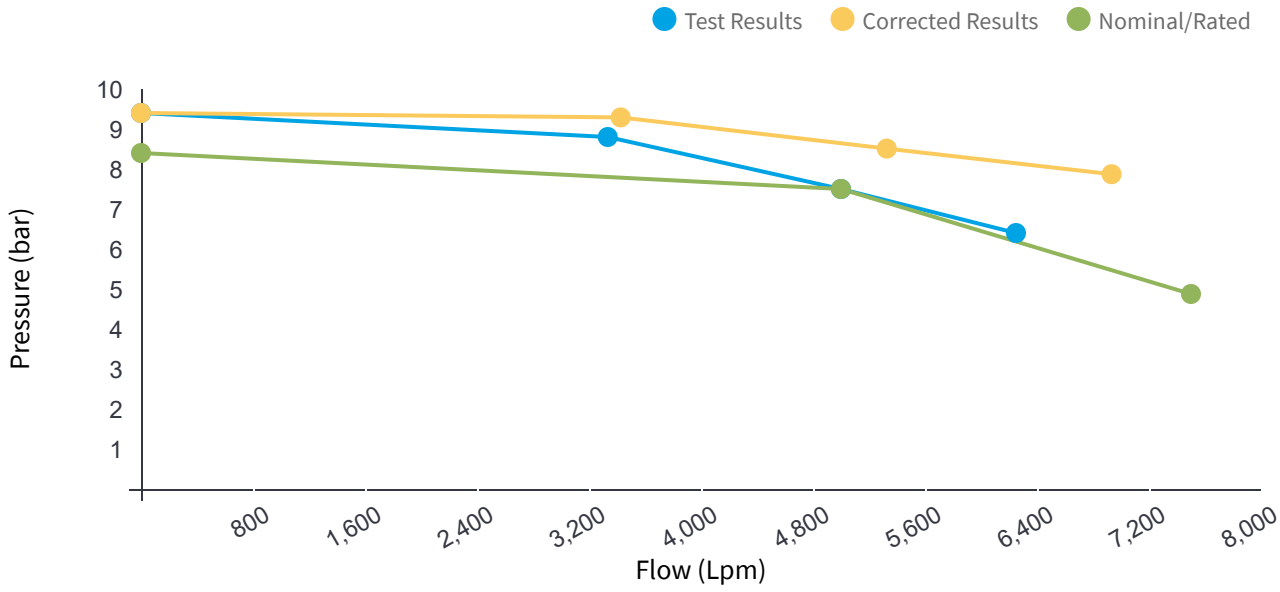
Comments

The sprinkler water reservoir is below the sprinkler pump room and therefore the pumps have negative suction, which is not desirable for fire fighting purposes as per NFPA 13. However the sprinkler pumps are filled using priming tanks. The total fire water supply has been designed to be in excess of 291 m3 . It has no low water detection alarm.

Fire Pump Diesel #1



Fire Pump Diesel #2



Protection

Category	Current Rating	Potential Rating	RI's
Sprinklers	Adequate	Good	1
Fire Extinguishing Equipment	Good	Good	0
Public Fire Department	Excellent	Excellent	0

Sprinklers

Building	AS (%)	ASA (%)	ASN (%)	Fire Detection (%)
GVB Remise Havenstraat	95.00	95.00	0.00	100.00
Total	**95.00**	**95.00**	**0.00**	**100.00**

Definitions: AS (%) =sprinklers provided, ASA (%) =adequate sprinklers provided, ASN (%) =sprinklers improvements needed, Detection=Smoke or other Fire Detection excluding sprinkler waterflow

Area protected	System	Existing Design	Required Design	Adjusted BOR (bar)	Existing Flow (Lpm)	Hose (Lpm)	Adequacy
Remise parts E/F/G/H/I/J	Wet	N III - VAS design upright (5 mm/min-600 m2)	N III - VAS design upright (5 mm/min-600 m2)		5.00	0.00	Adequate
Remise parts A/B	Dry	NIII - Spray upright (5 mm/min-600 m2)	NIII - Spray upright (5 mm/min-600 m2)			0.00	Adequate
Kantoren, techniekruimte, werkplaats	Wet	N III - VAS design pendent (5 mm/min-216 m2)	N III - VAS design pendent (5 mm/min-216 m2)		5.00	0.00	Adequate

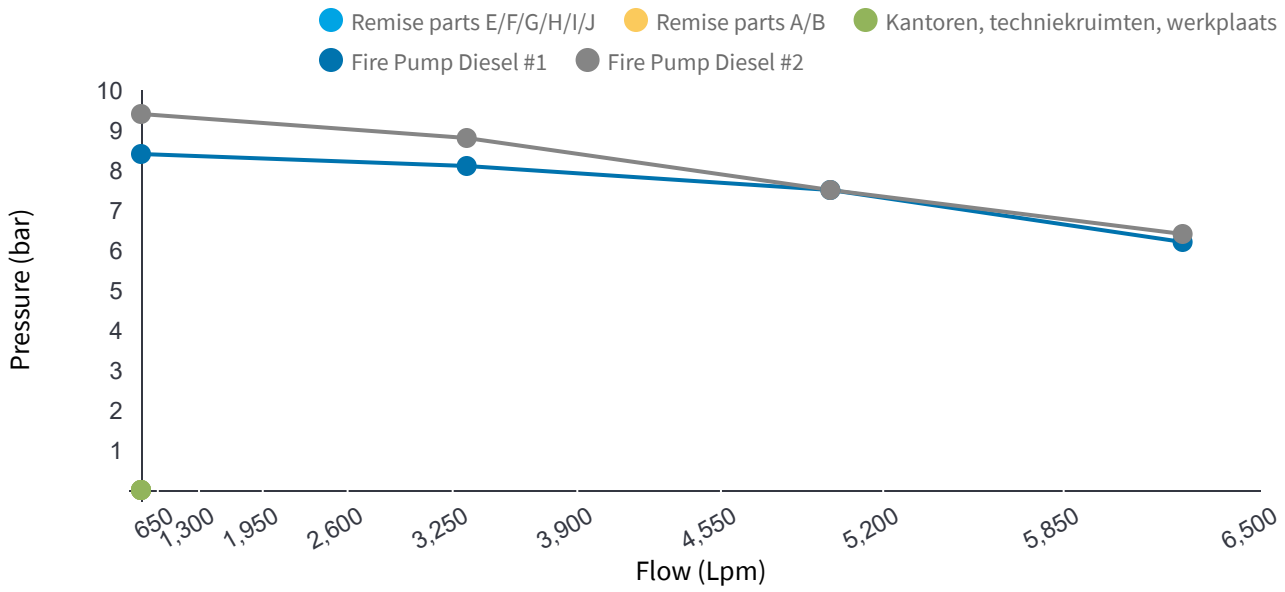
Definitions: Adequate = 100% of required sprinkler design hose. Nearly Adequate = 90% of required sprinkler design and no hose. Inadequate = less than 90% of required sprinkler design and no hose. Duration requirements must be met or rating is inadequate. For ESFR nearly

adequate is defined as full sprinkler design with NO HOSE.

Risk Improvements

Name	**LE Before** (EUR)	**LE After** (EUR)
SPRINKLER ROOM 16-12-03	0	0

Combined Water Supply and Sprinkler Demand Graph



Fire Extinguishing Equipment

Water Supply & Inspection Frequency

- Meets NFPA requirements

FEA/Hose Reel Details

- Equipment is properly maintained
- Inspections are properly documented with records maintained and readily available
- Plant personnel properly trained

Recommendations

None

Public Fire Department

Fire Department Type

- Full Time

Fire Department Features

- Fully trained and funded (adequate for the risk if special hazards exist)
- Fully equipped with required modern pumping appliances, ladders, aerial equipment, BA equipment

- Equipment regularly tested and maintained
- Full time emergency communications center to dispatch FD
- Closest FD participates w/ other local full-time FD's w/in a "mutual aide" concept
- Response time is less than 20 minutes

Fire Department Distances (kilometers)

Station #1	Station #2
1.40	2.90

Comments

Fire Station Pieter, Poedeldijkstraat 20 is approximately 4 minutes away by car at a distance of 1.4 km.

Fire Station Dirk , Honthorstraat 27 is approximately 9 minutes away by car at a distance of 3.2 km.

Supervision

Category	Current Rating	Potential Rating	RI's
Automatic Fire Detection	Good	Excellent	0
Security	Adequate	Good	0

Automatic Fire Detection

Signaling Systems
Central Station/ARC

Recognized
Yes

Monitored Line
Yes

Fire Protection Alarm
- Pump Running
- Valve Tampers
- Smoke Detection
- Low Building Temp
- Pull Boxes
- Pump Trouble
- Pump Power

Valve Locked
Partially

Fire Detection Coverage (Including Sprinklers)
at least 90%

Smoke Detection Monitored
Yes

Other Alarms
Yes

Maintenance, Testing and Inspection per NFPA 25
Satisfactory

Security

Security & Watch Service (24/7)
24/7 plant operations in all areas

Round Frequency
Other

Security Rounds
Unrecorded

Coverage
Other

Security Alarms
- CCTV

Intrusion Alarm Monitoring
Constantly attended location

Site Fencing and Barriers
- Single fence

Burglar and Theft Exposure
No

Vandalism / Malicious Mischief Exposure
No

Sabotage and Terrorism Exposure
No

Management Programs

Category	Current Rating	Potential Rating	RI's
Emergency Organization & Planning	Nearly Adequate	Good	0
Self-Inspection Program	Adequate	Good	1
Impairment Procedures	Nearly Adequate	Excellent	0
Contractor Management	Adequate	Good	0
Hot Work Permit	Nearly Adequate	Good	1
Smoking	Adequate	Excellent	0
Housekeeping	Adequate	Excellent	0
Planned Preventative Maintenance	Adequate	Adequate	0
Management Interest	Adequate	Excellent	0
Site Level Business Continuity Planning	Inadequate	Good	1

Emergency Organization & Planning

Written Emergency Action Plan
Not clearly defined roles or responsibilities, or missing key areas

Drills/practices conducted periodically
Yes

Fully Updated
No

Self-Inspection Program

Self-Inspection Program
- Yes

Documentation
- Informal or undocumented checklists

Frequencies
- Less often than weekly or not commensurate w occupancy/NFPA standards

Root cause & training
- Program exists but requires some minor additions

Risk Improvements
- Advisory

Risk Improvements

Name	Classification

Name	Classification
SELF INSPECTION PLAN- DEVELOP 21-12-04	Important

Impairment Procedures

Written and documented procedure
- Yes

Communication
- Not actively communicated to personnel or less than above

Impairment logging
- Paper logging system is utilized and fully up to date

Conforms to AIGs guidelines
- No

Risk Improvements
- Advisory

Contractor Management

Contractor Training Program
- Yes

Management Program Features
- Required for all contractors and sub-contractors
- Strongly supported by management with zero tolerance for misconduct

Records
- Maintained on paper logs

Risk Improvements
- Advisory

Hot Work Permit

Hot Work Program in Place
- No

Communication
- Not actively communicated to personnel or less than above

Logging
- No logging and no tags maintained

Is there Hot Work Occurring
- Yes – but none of the above conditions

Risk Improvements

Name	Classification
HOT WORK PROGRAM- DEVELOP 16-12-01	Important

Smoking

Policy
- Restricted to designated and appropriate onsite areas only

Appropriate Receptacles
- Yes

Inspections
- Less than weekly

Material Disposal
- Adequate

Risk Improvements
- None

Housekeeping

Quality
- Commensurate with exposure

Inspections
- Irregular or lack of inspections; lack of documentation

Risk Improvements
- None

Planned Preventative Maintenance

PM Program in place
- Yes – includes critical equipment only

PM System
- Partially documented or not documented

Overdue Assignments
- None

PM of Critical Components/Equipment
- Conforms to manufacturer's minimum requirements

Risk Improvements
- None

Management Interest

Management Interest
- Proactive
- Supportive
- Involved in Communications
- Respond Positively to Comments/Recommendations

Field Safety and Risk Management
- Important

Site Level Business Continuity Planning

Business Continuity Plan (BCP)
- No BCP or DCP in place

Risk Improvements

Name	Classification

Name	Classification
BUSINESS CONTINUITY PLAN- DEVELOP 21-12-02	Advisory

Exposures

Category	Current Rating	Potential Rating	RI's
Exposure	Slight	Negligible	0

Internal Exposure

None

External Exposure

External exposure is slight however should be monitored. To the sides the walls of the complex (masonry walls) are exposed a little through the parking of cars and the mophets and bikes stored here. To the fron the carage is somewhat exposed with mophets and light electrical vehicles being parked in the public area. Whilst the masonry stone walls can resist the heat flux of any potential fires, the roofing and wooden frame roof construction might be exposed a little during high radiant heat fires. It's advised to do self inspections and check that there is no excessive storage near buildings with flammable construction materials.

Yard Storage

There are minor piles with materials stored in the yard, mostly kept > 10 meter away from the building walls, however also see recommendation for self inspections. Some places there is yard storage where previously in 2016 there was none. Besides the trams standing idle there is currently not too much fire load standing in the yard. It is advised to keep it that way.

Water Intrusion Exposure

- Remediation company is on retainer
- No remediation plan exists

Aircraft Exposure

No

Structural Collapse Exposure

No

BI Exposures

General BI

The time element business interruption is currently not insured as part of the service with AIG. However, little information is available about the organisation of GVB and the potential BI exposure.

Production Lines, Key Plant Equipment, Bottlenecks and Critical Spares

It's likely that there are key plant equipment at the Havenstraat which if lossed will create bottlenecks. Not sure there are cirtical spares at this site. It is recommended to do a business interruption analysis for GVB to fill in the missing

pieces of information.

Raw Material Exposure

Unknown

CBI : Key Customers Exposure

Low Exposure

CBI : Attraction Properties Exposure

Unknown

Distribution Centers Exposure

Unknown

Warehousing of Fin. Products Exposure

Unknown

Key Interdependencies

Unknown

Makeup Capabilities

Unknown

Key EDP Equipment Exposure

Unknown

Electricity Interruption Exposure

The work completed in the tram remise building requires electricity in order to do the work. Without electricity there is no possibility to continue to the work. It is therefore expected that there is an electricity interruption exposure, however the BCP document is currently missing and the information was not available at the time of the survey.

Steam Interruption Exposure

There are 4 units available to create steam, hence there is a steam interruption exposure. However the BCP document is currently missing or not made available and the information was not available at the time of the survey. It is recommended to investigate this aspect further.

Risk Engineering Report

N.V. VERZEKERINGSBEDRIJF GROOT AMSTERDAM (VGA)

NATCAT Exposure Summary

	Flood	Wind	Earthquake	Hail	Collapse	Other
Zone/Exposure	<=100-year Flood Zone	38 m/s	MR Zone 0: <MMV	MRe Zone 2	No	Yes

Flood

Site Property Flood Zone
<=100-year Flood Zone

Flood Emergency Response Plan
Client has no BCP nor FERP in place

Mitigation Flood Defenses
No Flood Defenses

Redundant Power/Utilities
Client has no power nor utility redundancy

Site Access Vulnerability
Vulnerable Single Access to Site (Single bridge/tunnel)

Below Grade Construction
No below grade construction

Location of Critical Utilities
Primary and/or redundant power distribution equipment situated at ground level

Building	Flood Zone	Flood Source	FFE (m)	100 Yr Flood Elv. (m)	500 Yr Flood Elv. (m)
GVB Remise Havenstraat	<=100-year Flood Zone	Urban Flooding/Ponding/Stormwater	--	--	--

100 Yr Flood Loss Estimates

Total LE (EUR): 1,836,920

PD Loss Estimate

Building	Bldg (EUR)	M&E (EUR)	Content (EUR)	Stock (EUR)	Other (EUR)
GVB Remise Havenstraat	1,285,844 (5.00%)	0 (5.00%)	551,076 (5.00%)	0 (5.00%)	-- (--%)
Total	**1,285,844 (5.00%)**	**-- (--%)**	**551,076 (5.00%)**	**-- (--%)**	**-- (--%)**

Total Property Damage Loss Estimate (EUR): **1,836,920 (5.00%)**

TE Loss Estimate

Building	**BI** (EUR)	**Payroll** (EUR)	**Rent** (EUR)	**Downtime** (Months)
GVB Remise Havenstraat	-- (--%)	-- (--%)	-- (--%)	--
Total	**0 (--%)**	**0 (--%)**	**0 (--%)**	**--**

Total TE Loss Estimate (EUR): **-- (--%)**

500 Yr Flood Loss Estimates

Total LE (EUR): 3,673,840

PD Loss Estimate

Building	**Bldg** (EUR)	**M&E** (EUR)	**Content** (EUR)	**Stock** (EUR)	**Other** (EUR)
GVB Remise Havenstraat	2,571,688 (10.00%)	0 (15.00%)	1,102,152 (10.00%)	0 (15.00%)	-- (--%)
Total	**2,571,688 (10.00%)**	**-- (--%)**	**1,102,152 (10.00%)**	**-- (--%)**	**-- (--%)**

Total Property Damage Loss Estimate (EUR): **3,673,840 (10.00%)**

TE Loss Estimate

Building	**BI** (EUR)	**Payroll** (EUR)	**Rent** (EUR)	**Downtime** (Months)
GVB Remise Havenstraat	-- (--%)	-- (--%)	-- (--%)	--
Total	**0 (--%)**	**0 (--%)**	**0 (--%)**	**--**

Total TE Loss Estimate (EUR): **-- (--%)**

Wind

Wind Speed (m/s)	**Redundant Power/Utilities**	**Wind Emergency Response Plan**	**Asset Strengthening**
38			

Client has no power nor utility redundancy

Client has no BCP in place

Client has no documented asset strengthening - building > 17 years of age

Building	Distance to Coast
GVB Remise Havenstraat	10 and greater miles

Earthquake

EQ Zone
MR Zone 0:<MMV

Peak Ground Acceleration (%g)
2.00

EQ Emergency Response Plan
Client has no BCP in place

Redundant Power/Utilities
Client has no power nor utility redundancy

Seismic Bracing of Equipment
No seismic bracing or restraint is provided

Asset Strengthening
Client has no documented asset strengthening - building > 17 years of age

Seismic Gas Shutoff Valves (SGSV)
No SGSV's provided for flammable gas and liquid equipment

Fire Loss Estimates

All loss estimates developed as a result of our property surveys are for the sole use of AIG underwriters. Engineering loss estimates are based on the professional judgement of our engineer / consultants. There is detailed guidance and methodologies that are reference and used in the calculate of our Loss Estimates. Using our Loss Estimates without an understanding of the underlying guidance and methodologies is not recommended. AIG assumes no responsibility for use or reliance upon the loss estimates presented below.

	PD (M EUR)	**PD%**	**BI** (M EUR)	**BI%**	**IBI** (M EUR)	**TOTAL** (M EUR)
MAS	36.74	100.0		0.0		36.74
MFL	24.43	66.5		0.0		24.43
NLE	7.90	21.5		0.0		7.90

Reported Values

Property Damage

Building (EUR)	**Contents** (EUR)	**M&E** (EUR)	**Stock/Inventory** (EUR)	**Other PD** (EUR)
25,716,876	11,021,518	0	0	0

Business Interruption

Indemnity Period	**BI/Gross Revenues** (EUR)	**Rental Income** (EUR)	**Payroll** (EUR)
12 Months	0	0	0

Totals	**EUR**
Total Property Damage Value	36,738,394
Total BI Value	0
Total Insured Value	**36,738,394**

Maximum Amount Subject (MAS)

Total LE (EUR): 36,738,394

PD Loss Estimate

Building	**Bldg** (EUR)	**M&E** (EUR)	**Content** (EUR)	**Stock** (EUR)	**Other** (EUR)
GVB Remise Havenstraat	25,716,876 (100.00%)	0 (70.00%)	11,021,518 (100.00%)	0 (70.00%)	0 (0.00%)
Total	**25,716,876 (100.00%)**	**-- (--%)**	**11,021,518 (100.00%)**	**-- (--%)**	**-- (--%)**

Total Property Damage Loss Estimate (EUR): **36,738,394 (100.00%)**

TE Loss Estimate

Building	**BI** (EUR)	**Payroll** (EUR)	**Rent** (EUR)	**Downtime** (Months)
GVB Remise Havenstraat	-- (0.00%)	-- (0.00%)	-- (0.00%)	--
Total	**0 (--%)**	**0 (--%)**	**0 (--%)**	**--**

Total TE Loss Estimate (EUR): **0 (--%)**

Maximum Foreseeable Loss (MFL)

Total LE (EUR): 24,431,032

PD Loss Estimate

Building	**Bldg** (EUR)	**M&E** (EUR)	**Content** (EUR)	**Stock** (EUR)	**Other** (EUR)
GVB Remise Havenstraat	16,715,969 (65.00%)	0 (70.00%)	7,715,063 (70.00%)	0 (70.00%)	0 (0.00%)
Total	**16,715,969 (65.00%)**	**-- (--%)**	**7,715,063 (70.00%)**	**-- (--%)**	**-- (--%)**

Total Property Damage Loss Estimate (EUR): **24,431,032 (66.50%)**

TE Loss Estimate

Building	**BI** (EUR)	**Payroll** (EUR)	**Rent** (EUR)	**Downtime** (Months)
GVB Remise Havenstraat	-- (0.00%)	-- (0.00%)	-- (0.00%)	--
Total	**0 (--%)**	**0 (--%)**	**0 (--%)**	**--**

Total TE Loss Estimate (EUR): **0 (--%)**

Loss Estimate Comments

Because there are no reliable fire walls and fire separations, a fire could result in a total loss if the sprinkler malfunctions and the fire service does not intervene. In view of the low fire load and the vastness of the complex, we consider this scenario to be hardly conceivable.

Normal Loss Expectancy (NLE)

Total LE (EUR): 7,898,755

PD Loss Estimate

Building	**Bldg** (EUR)	**M&E** (EUR)	**Content** (EUR)	**Stock** (EUR)	**Other** (EUR)
GVB Remise Havenstraat	5,143,375 (20.00%)	0 (10.00%)	2,755,380 (25.00%)	-- (--%)	-- (--%)
Total	**5,143,375 (20.00%)**	**-- (--%)**	**2,755,380 (25.00%)**	**-- (--%)**	**-- (--%)**

Total Property Damage Loss Estimate (EUR): **7,898,755 (21.50%)**

TE Loss Estimate

Building	**BI** (EUR)	**Payroll** (EUR)	**Rent** (EUR)	**Downtime** (Months)
GVB Remise Havenstraat	-- (0.00%)	-- (0.00%)	-- (0.00%)	--
Total	**0 (--%)**	**0 (--%)**	**0 (--%)**	**--**

Total TE Loss Estimate (EUR): **0 (--%)**

Loss Estimate Comments

If the sprinkler system intervenes adequately, a fire will be limited to a small part of the buildings with smoke and soot damage to other parts. Rolling stock is not considered in Loss Scenario's as yet. Estimated 125 trams with a current value of € 896,462 represent a sum of more than 112 million euros according to MS Amlin report from 2016. No new data provided by VGA. It's suggested to incorporate this as part of the homework like the IPB-document. A business continuity study is advised as well, see recommendations related to creating an BCP-document. Based on the scenario's defined, a better picture of the NLE and MFL can be defined during a special kick off meeting or customer contact. At this point in time there is not enough information related to the GVB organisation to fill in the gaps. A recommendation for future surveys is added to the end of this report for internal use by AIG.

Images and Site Sketches

Aerial picture of site

Risk Improvement Classification

Critical

Critical recommendations represent conditions or work practices that create an imminent or severe loss-producing situation. This means that there must be a readily available ignition source or the potential for a severe loss event.

Important

Important recommendations represent conditions or work practices that could result in a loss -producing situation, but for which immediate action is not necessary. These are recommendations to correct uncontrolled exposures or to achieve and maintain a reasonable level of property protection. These recommendations require commitment on the part of the insured to change or modify conditions or work practices in order to reduce the potential for serious loss, resulting from either frequency or severity events.

Advisory

Advisory recommendations represent conditions or work practices that do not directly pose a risk for severe loss or injury, but could contribute to a loss situation. These are recommendations that are considered best practices to enhance the level of property protection. Compliance with these recommendations improves the risk and reduces the likelihood of a loss occurring from the recognized hazard or situation.

Risk Improvement Types

Physical Protection:

A Physical Protection Risk Improvement is associated with provision of physical plant and equipment; typically there could be a capital expenditure associated with these improvements.

Management Programs

A Management Programs Risk Improvement typically relates to procedures and management programs and will not normally involve, or will have limited, capital expenditure.

NATCAT:

NATCAT Risk Improvement is either a physical improvement or the addition/enhancement of management procedures to reduce the risk associated with natural catastrophe events.

B&M Management Programs

A B&M Management Programs Risk Improvement relates to procedures and management programs, such as inspection, testing and maintenance, which will not normally involve, or have limited capital expenditure. Such a risk improvement is directed at reducing the probability of the identified risk exposure.

Loss Estimate Definitions

Maximum Amount Subject (MAS)

The Maximum Amount Subject (MAS) is defined as the area of the largest insured value (PD and BI) that is subject to a single fire or explosion. The amount Subject area will only be limited by clear space separation that is sufficient to restrict the spread of fire, as defined in the Space Separation Table which is found in the AIG Commercial Property Field Engineering Manual, MFL section. MAS considers complete failure of all active protection including automatic sprinkler systems, all water supplies, automatic extinguishing systems, alarm supervision, public and private water supplies, no firefighting effort and offers no credit for MFL or fire walls, fire proofing or other passive barriers. In circumstances where the location consists of only one building, the Amount Subject will normally be equal to the full TSI for that building. Calculate of MAS will include PD, BI, BI interdependencies, contingent BI and any other time element values such as Extra Expense, Extended Period of indemnity, Rents, etc.

Maximum Foreseeable Loss (MFL)

MFL is defined as the largest amount of loss that can be anticipated (including PD, BI, BI interdependencies, contingent BI and any other time element values such as extra expense, extended period of indemnity, rents, etc. due to a fire and/or explosion event with all fire protection systems and equipment out of service and with no fire-fighting effort, either public or private. The loss would be that which occurs if the fire were allowed to “burn freely” unit it burns itself out. The MFL area is the maximum plant area that could be affected by a single fire or explosion, occurring in the more vulnerable area of the facility (i.e. that with the largest total PD and BI potential). The only acceptable ways to reduce the MFL estimate are:

- Adequate clear space separation between buildings
- Lack of continuity of combustibles
- Effective horizontal cut-offs with MFL walls
- Effective vertical cut-offs
- Expectable salvage values
- Reliable make-up capacity

Airports, High Rise Buildings, Hospitals and Universities are treated as unique and may have a MFL calculation that differs from the above providing certain favorable factors exist.

Normal Loss Estimate (NLE)

The Normal Loss Estimate (NLE) is defined as the largest loss anticipated for a location under existing conditions. The NLE for a protected (sprinklered) facility assumes that the existing automatic and manual protection functions as designed and for intended and in its existing condition, whether it is adequate for the occupancy or not. This can include both public and private protection, including fixed automatic protection (such as sprinkler systems with reliable water supplies), other fixed automatic protection (such as special extinguishing systems or fire alarms with off-site signaling), and proximity of the public fire department and availability of public and private water supplies for firefighting purposes. In addition, construction characteristics are considered that include firewalls, draft curtains, roof parapets, fire doors, etc., as these factors relate to the hazard and combustibility of the occupancy. Fire department

response is anticipated.
Factors that could influence the NLE include:

- Construction classification and characteristics including fire walls, fire doors, etc.
- Occupancy and contents susceptibility to damage (smoke or water damage
- Continuity of combustibles and combustible loading (light, moderate, heavy)
- Sprinkler protection/water supply adequacy
- Special hazard conditions, protection and controls
- Public Fire Department
- Fire alarms and Central Station monitoring

Deficiencies, minor in nature that are not expected to contribute significantly to a loss but do represent or could contribute to unsafe conditions or unsafe acts. These are recommendations that are considered best practices to enhance the level of property protection. Although compliance with these recommendations improves the risk and reduces the likelihood of a loss occurring from the recognized hazard or situation, they are considered desirable and not mandatory in nature.