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MR PRUYSSENS Session 3
HESDAGH.

IN 1982 HESSENATIE STARTED TO OPERATE A NEW TERMINAL LOCATED ON THE 9TH HARBOUR DOCK. UP TO THAT PERIOD CONTAINERS IN ANTWERP WERE HANDLED ON SO-CALLED MIXED CARGO TERMINAL WHERE DIFFERENT COMMODITIES WERE HANDLED. THE INFRASTRUCTURE (CRANES, WAREHOUSES, ETC) WERE DESIGNED ACCORDING TO THE NECESSITIES OF THAT OPTION.

HESSENATIE'S TERMINAL IN THE NEW DOCK WAS THE FIRST IN ANTWERP TO BE CREATED AND OPERATED AS A FULL CONTAINER TERMINAL. THIS ALLOWED HESSENATIE TO DESIGN A LAYOUT WHERE OPERATIONS COULD GO ON VERY EFFICIENTLY AND WITH A HIGH DEGREE OF SAFETY.

AFTER 3 YEARS OF OPERATION, THE REAL GROWTH ON THIS TERMINAL EXCEEDED THE FORECASTS AND HESSENATIE STARTED TO INVESTIGATE FURTHER EXPANSION POSSIBILITIES.

IN THE SAME PERIOD SOCIAL CONFLICTS WITHIN THE GROUP PORT AUTHORITY EMPLOYEES RESULTED IN VARIOUS STRIKES OF THE LOCK OPERATORS. THESE ACTIONS STRESSED THE TERMINAL OPERATORS' DEPENDENCY ON THE LOCK OPERATORS' "GOODWILL".

THESE TWO FACTS RESULTED IN 1985 IN HESSENATIE'S CONCEPT OF A TERMINAL STRAIGHT ON THE RIVER AND THUS OUTSIDE THE LOCKS. AT THAT TIME THIS IDEA WAS CONSIDERED

UNREALISTIC FROM BOTH NAUTICAL AND CONSTRUCTION POINT OF VIEW. HOWEVER, HESSENATIE CONTINUED TO DEVELOP THIS IDEA AND PROVED TO BE RIGHT. ACTUALLY TWO NEW PROJECTS FOR TERMINALS ON THE BANK OF THE RIVER ARE ON STUDY.

BUT GOING BACK TO 1985 THIS CONCEPT PRODUCED TWO MAJOR COMMERCIAL ARGUMENTS FOR HESSENATIE :

- THE VESSELS SAILING SCHEDULE IS NOT HINDERED BY ANY TROUBLE ON THE LOCKS.
- SHIP'S OPERATORS REALIZE A TIME SAVING OF ABOUT 6 HOURS BY NOT ENTERING THE LOCKS.

THIS SATELLITE PICTURE GIVES YOU A GENERAL OVERVIEW OF THE FLOWING OF THE RIVER SCHELDT. ON THE LEFT HAND YOU SEE THE ESTUARY, ON THE RIGHT HAND THE ANTWERP DOCKS ARE SITUATED.

THE SELECTION OF A LOCATION FOR THIS TERMINAL WAS IN FACT EASY. THE MOST APPROPRIATE ONE APPEARED TO BE THE LOCATION OPPOSITE THE NUCLEAR PLANT OF DOEL. THE VICINITY OF THIS PLANT DID NOT INFLUENCE HESSENATIE'S DECISION SINCE AN ACCIDENT AT THIS PLANT WOULD HAVE THE SAME IMPACT WHETHER THIS TERMINAL IS 5 KM DOWNSTREAM OR UPSTREAM. IN FACT, A SERIOUS NUCLEAR ACCIDENT WOULD IMPACT A MAJOR PART OF THE PROVINCE OF ANTWERP.

DURING ALMOST 2 YEARS HESSENATIE INVESTIGATED ON THE NAUTICAL AND MARINE PROBLEMS CONCERNING THE TERMINAL. THE PRELIMINARY AND IN-DEPTH FEASIBILITY STUDIES WERE COORDINATED BY THE OWN RESEARCH DEPARTMENT AND CARRIED OUT IN CLOSE COOPERATION WITH UNIVERSITY DEPARTMENTS, PORT AUTHORITIES AND PILOTS.

THE MARINE ASPECTS INVESTIGATED WERE :

1. ACCIDENT POSSIBILITY FOR VESSELS WHILE BERTHING AND LEAVING.
2. INFLUENCE OF THE CONSTRUCTION ON THE RIVER'S ATTITUDE DOWNSTREAM AND UPSTREAM.

F.E. POINT 1 REQUIRED SIMULATION OF ABOUT 300 SAILINGS IN DIFFERENT CONDITIONS. THE PARAMETERS USED WERE :

- VESSELS LENGTH (UP TO 300 M)
- TIDES
- WIND SPEEDS 5 TO 8 BEAUFORT FROM DIFFERENT DIRECTIONS
- HEAVY RAIN AND FOG CONDITIONS

AFTER THE OUTCOME OF THESE STUDIES PROVED TO BE POSITIVE, NEGOTIATIONS WITH THE MINISTRY OF PUBLIC WORKS AND SEVERAL CONTRACTORS STARTED AND RESULTED IN THE BUILDING START IN APRIL 1987. STRINGENT FOLLOW-UP OF THE BUILDING PROGRAM RESULTED IN THE BERTHING OF THE FIRST VESSEL IN APRIL 1990, EXACTLY 3 YEARS

LATER.

BEFORE WE START THE RISK ANALYSIS, I WOULD LIKE TO GIVE YOU SOME MORE INFORMATION HOW A CONTAINER TERMINAL OPERATES AND SOME TECHNICAL DATA. IT WILL SURELY CREATE MORE UNDERSTANDING FOR THE NEXT ASPECTS OF THE PRESENTATION.

1. WHAT IS A CONTAINER TERMINAL

A CONTAINER TERMINAL IS A LINK IN THE CHAIN OF INTERNATIONAL TRANSPORT. IT IS A CENTER OF TRANSSHIPMENT FOR THE DIFFERENT TRANSPORT MODI SEA CARRIAGE, ROAD HAULAGE AND RAILROAD TRANSPORT.

SERVICES OFFERED TO CUSTOMERS ARE :

- LOADING AND DISCHARGING OF VESSELS, BARGES, TRAILERS AND WAGONS
- DAMAGE INSPECTION ON CONTAINERS
- STUFFING AND STRIPPING OF CONTAINERS
- FULLY ADMINISTRATIVE FOLLOW-UP
- DEPOT OPERATORS FOR EMPTY CONTAINER
- OPERATING REEFER UNITS

IN CHRONOLOGICAL ORDER THE ACTIVITIES ARE :

IMPORT CONTAINERS

- DISCHARGE FROM VESSEL
- CHECK ON CONDITION OF CONTAINERS
- PARKING IN IMPORT ZONE WAITING FOR DELIVERY
- LOADING ON TRUCK, WAGON OR BARGE
- PHYSICAL CHECK OF CONTAINERS AND ADMINISTRATION OF ALL RELEVANT INFORMATION

EXPORT

- ADMINISTRATION OF ALL RELEVANT DATA
- PHYSICAL CHECK OF THE CONTAINERS
- PARKING IN EXPORT ZONE
- LOADING IN VESSEL

TECHNICAL DATA

THE TERMINAL AREA SURFACE IS 63 HA AND IS SPLIT INTO 3 PARTS BY 2 PUBLIC ROADS. PRIVATE HESSENATIE BRIDGES LINK THE 3 PARTS. THE QUAY LENGTH IS 1.180 M.

ACTUALLY 4 SUPER PANAMAX GANTRY CRANES ARE OPERATIONAL TO LOAD AND UNLOAD THE VESSELS. THEY ARE CAPABLE OF HANDLING ALL CONTAINER SIZES FROM 20' TO 48' AT A

RATE OF 240 CONTAINERS PER SHIFT OR APPROXIMATELY 35 PER HOUR. ONE CRANE WEIGHS 1.005 TON, IS 85 METER HIGH AND WITH A FLAT BEAM 105 METER WIDE. HOISTING SPEED IS 90 M/MIN. AT 45 T.

ALL HORIZONTAL TERMINAL TRANSPORT IS EXECUTED BY STRADDLE CARRIERS (LOADED CONTAINERS AND FORKLIFTS (EMPTY CONTAINERS)). THESE STRADDLE CARRIERS CAN LIFT A 40 T CONTAINER UP TO 9 METERS; THIS ENABLES HIM TO STACK CONTAINERS 3 HIGH. THEIR MAXIMUM DRIVING SPEED HAS - FOR SECURITY REASONS - BEEN LIMITED TO 25 KM/HOUR.

THANK YOU, ROGER FOR YOUR INTRODUCTION AND THANKS TO THE ORGANIZERS OF THIS CONFERENCE, TO INVITE ME HERE TO SHARE WITH YOU AND YOUR FELLOW RISK MANAGERS THE RISK ANALYSIS OF THE HESSENATIE'S CONTAINER TERMINAL.

BEFORE TAKING-OFF, I WOULD LIKE TO MAKE SOME STATEMENTS ON RISK MANAGEMENT IN GENERAL. A POSSIBLE DEFINITION OF RISK MANAGEMENT COULD BE :

* THE IDENTIFICATION, THE ANALYSIS AND THE CONTROL OF RISKS THAT THREATENS THE ASSETS OR EARNING CAPACITY/CAPABILITY OF AN ENTERPRISE.

WITH "IDENTIFICATION OF RISK" THE QUESTION IS RAISED : HOW CAN THE ASSETS OR EARNING CAPACITY/CAPABILITY OF THE ENTERPRISE BE THREATENED ?

WITH "ANALYSIS OF RISK" IS MEANT "HOW IMPORTANT IS THE RISK TO THE ENTERPRISE IN FINANCIAL TERMS/CONDITIONS.

WITH "THE CONTROL OF RISK", WE REFER TO THOSE RISKS IDENTIFIED WHERE THE ANALYSIS INDICATES THE IMPORTANCE OF THE RISK AND WHAT ACTIONS WE TAKE TO CONTROL THIS RISK.

THE THREE MAIN DIRECTIONS OF RISK HANDLING THAT ARE AVAILABLE, ARE :

A) RETENTION OF RISK

B) TRANSFER OF RISK

C) REDUCTION OF RISK

THE SUBJECT DISCUSSED TODAY WILL BE FOCUSING ON ITEM C) - REDUCTION OF RISK AND MORE PARTICULARLY THE PRO-ACTIVE BEHAVIOUR, TO IDENTIFY THE RISK AND TAKE THE NECESSARY STEPS TO REDUCE/ELIMINATE OR CONTROL THIS RISK.

THESE STEPS COULD BE FOR EXAMPLE : MODIFICATION OF A PHYSICAL SITUATION OR THE ISSUANCE OF INSTRUCTIONS HOW CERTAIN ACTIONS HAVE TO BE CARRIED OUT OR WHAT REACTIONS TO TAKE IF A POTENTIAL LOSS SITUATION OCCURS.

IN SIMPLE TERMS, WE ARE UNDERLINING THE MANAGEMENT CONTROLS ON THE OPERATIONS THAT ARE TAKING PLACE.

I AM CONVINCED THAT EVERYONE IS AWARE OF HEINRICH'S DOMINO THEORY WHERE HE CONSIDERED THE SOCIAL ENVIRONMENT/ANCESTRY TO BE THE CONTROLLING FACTOR IN PREVENTING ACCIDENTS AND INJURIES. AS YOU ARE AWARE THIS THEORY GOT OVER THE YEARS ADAPTED TO REPRESENT THE DOMINO THEORY AS FOLLOWS :

1st - LACK OF MANAGEMENT CONTROL

2nd - BASIC CAUSE OF ACCIDENT

3rd - IMMEDIATE CAUSE OF ACCIDENT

4th - ACCIDENT CONTACT

5th - LOSS

IN THE FOLLOWING ANALYSIS OF THE VARIOUS RISKS IDENTIFIED WE WILL BE SHOWING THE RISK MANAGEMENTS' TECHNIQUES USED TO CONTROL AND/OR ELIMINATE THE BASIC CAUSES TO REDUCE OR PREVENT THE OCCURRENCE OF LOSSES.

THE RISKS THAT HAVE BEEN ANALYZED FOR THESE PRESENTATIONS ARE, AS YOU CAN SEE AT THIS OVERHEAD, THE RISK TO PROPERTY DAMAGE, THE RISK TO BUSINESS INTERRUPTION, THE EXPOSURE TO THE WORKMAN'S COMPENSATION AND VARIOUS LIABILITY EXPOSURES.

I WILL ADDRESS THE FIRST TWO AREAS AND ROGER MESDAGH WILL DISCUSS THE NEXT TWO SUBJECTS.

LET'S LOOK AT THE PROPERTY DAMAGE, WE CAN DEFINE WHAT EXPOSURE TO PROPERTY WOULD AFFECT THE OPERATIONS OF THIS CONTAINER TERMINAL.

IN ORDER OF IMPORTANCE, THE PROPERTY IS :

1) THE WORKSHOP/EDP BUILDING

2) THE UTILITIES

3) THE CRANES AND CARRIERS AND FINALLY

4) THE OFFICES.

THE MAJOR EXPOSURES FOR THE PROPERTY ARE CONSIDERED TO BE FIRE, FLOOD, IMPACT AND STORM.

LET'S NOW HAVE A LOOK IN DETAIL ON THE OCCUPANCY OF THE VARIOUS PROPERTIES EXPOSED AND THE SUSCEPTIBILITY TO THE FOUR LISTED EXPOSURES. WE WILL ALSO IDENTIFY ACTION TAKEN TO REDUCE THE RISKS TO THE ACCEPTABLE LEVELS CONSIDERED FOR THIS OPERATION.

1) THE WORKSHOP/EDP CENTER.

1. THE OCCUPANCY OF THE WORKSHOP :

THIS OCCUPANCY IS ONE OF A TYPICAL GARAGE. IT CONSISTS OF A SMALL SIZED (200 M^2) SPARE PARTS WAREHOUSE AND THE REMAINDER IS SPLIT INTO TWO AREAS - ONE FOR MAINTENANCE OF THE STRADDLE CARRIERS AND THE OTHER FOR THE MAINTENANCE OF ANY OTHER EQUIPMENT.

THE OCCUPANCY OF THE EDP AREA IS :

AN IBM AS400 UNIT THAT PROCESSES ACCEPTANCE OF CONTAINER, DESTINATIONS OF CONTAINERS AND LOADING AND UNLOADING PLANS OF CONTAINER VESSEL. IT IS

NEEDLESS TO SAY THAT THIS ELECTRONIC DATA PROCESSING UNIT IS INDEED THE HEART AND THE KEY OF FAST AND EFFICIENT CONTAINER MOVEMENT OPERATIONS. [FOR REASONS THAT I WILL NOT GO INTO AT THIS MOMENT, THE CONTAINER OPERATOR HESSENATIE HAS DECIDED TO LOCATE BOTH OPERATIONS IN THE SAME BUILDING.]

THE FIRE EXPOSURE CREATED BY THE WORKSHOP TO THE EDP UNIT IS CONSIDERED MODERATE. NOTWITHSTANDING THE FACT THAT THE FIRE LOAD IN THE COMPUTER AREA ITSELF IS CLASSED "LOW", THE FIRE HAZARD IN THE WORKSHOP AREA IS CONSIDERED "MODERATE". IT IS ACCEPTED THAT THE IGNITION HAZARD IN THE WORKSHOP MAY BE CLASSIFIED "HIGH", THE COMBUSTIBLE LOAD HOWEVER THROUGHOUT THIS FACILITY IS KEPT LOW AND THEREFORE WE THINK IT IS JUSTIFIED TO RATE THE EXPOSURE TO THE EDP CENTER AS BEING "MODERATE".

THE RISK CONTROLLING ACTIONS THAT HAVE BEEN TAKEN TO REDUCE THE EXPOSURE TO ACCEPTABLE LIMITS FOR THIS UNIT ARE :

A) THE BUILDINGS HAVE BEEN BUILT USING NON-COMBUSTIBLE BUILDING MATERIALS.

B) THE COMBUSTIBLE LOAD HAS BEEN REDUCED TO THE BARE MINIMUM. THIS IMPLIES

THAT THE SPARE PARTS WAREHOUSE IS KEPT MINIMUM IN SIZE AND THAT NO LUBRICATION OILS, FUELS OR OTHER LIQUIDS ARE STORED INSIDE. INDEED, NONE OF THE REFUELING NEEDS OF THESE STRADDLE CARRIERS OR OTHER TRANSPORT EQUIPMENT IS DONE INSIDE THIS WORKSHOP. ALSO THE LUBRICATION AND HYDRAULIC OILS ARE STORED DETACHED FROM THIS BUILDING, ONLY SHIFT NEEDS ARE KEPT IN THE WORKSHOP.

TAKING INTO ACCOUNT THE HAZARDS CREATED BY THE WASTE OIL OBTAINED DURING REGULAR OIL CHANGES, MANAGEMENT DECIDED TO HAVE A CENTRALIZED WASTE OIL COLLECTION SYSTEM INSTALLED UNDERGROUND. IN THIS TANK, THAT IS LOCATED OUTSIDE THE BOUNDARIES OF THE BUILDING, THE OILS ARE COLLECTED AND ONCE EVERY SO MANY MONTHS THE WASTE OIL IS COLLECTED BY A WASTE OIL TREATMENT COMPANY.

IN VIEW OF THE FOREGOING (CONTROL ON COMBUSTIBLE LOAD), IT WAS THEREFORE DECIDED NOT TO INSTALL AUTOMATIC FIRE PROTECTION SYSTEMS LIKE SPRINKLERS FOR THIS WORKSHOP AREA BUT RATHER STAY WITH ADEQUATELY SIZED AND INSTALLED MANUAL FIRE FIGHTING MEANS THAT CONSIST OF A NETWORK OF INSIDE HOSE REELS AND PORTABLE EXTINGUISHERS IN VARIOUS SIZES AND CLASSES, DEPENDING UPON THE AREA AND COMBUSTIBLES THEY ARE EXPECTED TO BE USED ON.

THIS INTERNAL SYSTEM IS BACKED-UP WITH A NETWORK OF OUTSIDE HYDRANTS LOCATED

AROUND THE FACILITY PROVIDED WITH A SUFFICIENT AMOUNT OF EQUIPMENT THAT IS KEPT IN THE VICINITY OF THE HYDRANTS. THE STAFF PRESENT IN THIS AREA HAS RECEIVED A TRAINING IN THE USE OF THIS EQUIPMENT AND REFRESHMENT COURSES ARE SCHEDULED AT ANNUAL FREQUENCIES.

C) MANAGEMENT CONTROLS ARE STRICT ON EXCELLENT HOUSEKEEPING STANDARDS IN AND AROUND THE WORKSHOPS AS WELL AS ON SMOKING HABITS. IT IS WELL KNOWN THAT SMOKING IS ONE OF THE MAJOR CAUSES OF FIRE AND CONSEQUENTLY MANAGEMENT HAS OPTED FOR THE SOLUTION TO HAVE SMOKING BANNED THROUGHOUT THE WORKSHOP AND THE SPARE PARTS STORAGE AREA.

EVERYBODY HERE WILL BE CONVINCED THAT BANNING SMOKING SEEMS PRETTY SIMPLE, REALITY HOWEVER SHOWS THAT IF YOU BAN SMOKING, HIDDEN SMOKING WILL CONTINUE. HIDDEN SMOKING IS CONTROLLED BY AN AWARENESS PROGRAM (TOP-DOWN) AND BY PROVIDING SMOKING AREAS NEAR THE COFFEE MACHINE WHERE PEOPLE MAY HAVE THE CUP OF COFFEE AND THEIR SO NEEDED CIGARETTE.

D) PAINT SPRAYING OF ANY PIECE OF EQUIPMENT IS FORBIDDEN INSIDE THIS COMPLEX.

IN VIEW OF THE FOREGOING, I REPEAT THAT THE FIRE HAZARD/EXPOSURE TO THE EDP

IS RATED "MODERATE". LET'S NOW LOOK AT CONSTRUCTION DETAILS ON HOW THIS EXPOSURE IS CONTROLLED. THE WORKSHOP CONSISTS OF APPROXIMATELY 12 METERS HIGH STEEL STRUCTURE SINGLE STOREY WITH NON-COMBUSTIBLE SANDWICH PANEL WALLS AND A NON-COMBUSTIBLE METAL DECK. THE COMPUTER OPERATIONS HOWEVER ARE CONSTRUCTED OUT OF CONCRETE BLOCK WALLS AND PRESTRESSED CONCRETE COLUMNS AND CONCRETE BEAMS. THE PRACTICE OF CONSTRUCTING THIS FACILITY IN THIS WAY AND ASSURING THAT THERE ARE NO OPENINGS WHATSOEVER BETWEEN THE WORKSHOP AND THE ELECTRONIC DATA PROCESSING OPERATION GIVES US INDEED A FREE STANDING 2 HOUR RATED FIRE BARRIER. I ALSO WANT IN THIS PARTICULAR CASE TO DRAW YOUR ATTENTION TO THE FACT THAT THE PRESTRESSED CONCRETE COLUMNS AND BEAMS ARE INSTALLED ON THE NON EXPOSED SIDE OF THE WORKSHOP OPERATIONS.

THE FIRE HAZARD THAT EXISTS IN THE EDP OPERATION (FIRE HAZARD CREATED BY THE HARDWARE INSTALLED) HAS BEEN PROTECTED BY A SINGLE SHOT GAS EXTINGUISHING SYSTEM WHICH IS A HALON 1301, THAT IS TRIGGERED BY A CROSS-ZONED SMOKE DETECTION SYSTEM INSTALLED IN THE THREE AREAS OF THIS ELECTRONIC DATA PROCESSING UNIT, NAMELY THE FALSE CEILING, THE ROOM ITSELF AND IN THE FALSE FLOOR AREA. ALSO IN THE INSTALLATION OF THIS EDP FACILITY LOW FLAME SPREAD CABLING IS USED.

FURTHERMORE, ALARM PUSH-BUTTONS HAVE BEEN INSTALLED FOR THE ENTIRE UNIT

WORKSHOP/EDP THAT RELAYS THE ALARMS OVER SUPERVISED ELECTRICAL WIRING TO THE :

A. TECHNICAL SUPERVISOR'S OFFICE IN WORKSHOP / A CONSTANTLY ATTENDED LOCATION.

B. ADMINISTRATION OFFICE ON THE FACILITIES.

C. PUBLIC FIRE DEPARTMENT THAT IS LOCATED AT APPROX. 1 KM FROM THE FACILITY.

THIS BUILDING UNIT (WORKSHOP/EDP) HAS ALSO BEEN ELECTED TO BE THE KEY FACILITY TO TREAT EMERGENCY SITUATIONS. A PERMANENCY IS ASSURED IN SUCH A WAY THAT THERE IS ALWAYS A TECHNICAL SUPERVISOR AVAILABLE IN THIS UNIT. INDEED, IN THIS FACILITY THE FIRST AID CONTAINER CRATE IS KEPT, THIS CRATE IS FOR THE COLLECTION OF SICK OR INJURED PEOPLE FROM THE CRANES OR FROM VESSELS.

THIS TECHNICAL SUPERVISOR HAS RECEIVED A TRAINING IN EMERGENCY SITUATIONS LIKE FIRE AND ACCIDENTS ON THE CONTAINER TERMINAL.

LET'S NOW LOOK AT THE FLOOD EXPOSURE OF THESE FACILITIES.

IT IS TRUE THAT ORIGINALLY THE FLOOD EXPOSURE COULD BE RATED AS SEVERE TAKING INTO ACCOUNT THAT THE CONTAINER TERMINAL IS LOCATED AT THE BANKS OF THE RIVER "SCHELDE" THAT IS IN DIRECT CONTACT WITH THE NORTH SEA AND CONSEQUENTLY IS TIDAL

WATER. THIS IMPLIES THAT APART FROM THE NORMAL TIDES, SPRING TIDE OCCURS. THIS OCCURS ONCE PER YEAR WITH HIGH WATER BEING AT + 6.5 METERS AND THROUGH A NUMBER OF POSSIBILITIES ONCE EVERY 50 YEARS WITH HIGH WATER BEING + 7.4 METERS. TAKING INTO ACCOUNT THAT THE QUAY WALL IS APPROXIMATELY + 9 METERS, IT IMPLIES THAT THEORETICALLY SPRING TIDE TOGETHER WITH A NORTH-WESTLY OR SOUTH-SOUTH-WESTLY STORM COULD FLOOD THE FACILITIES.

A SIMILAR DISASTER OCCURRED EARLY 1953, FLOODING THE NETHERLANDS AND THIS AREA BADLY. THIS PROMPTED THE DUTCH GOVERNMENT TO A VERY AGGRESSIVE PROTECTION PLAN AGAINST FLOODS AND THE DELTA PLAN (THAT IS HOW IT IS CALLED AND CONSISTS OF INCREASING DIKE HEIGHTS, CUTTING OFF MAJOR WATER WAYS, OR PUTTING IN STORM PROTECTORS) WAS CREATED TO PROTECT THE DUTCH COUNTRY. AS A CONSEQUENCE OF THE CHARACTERISTICS OF WATER, BELGIUM STARTED TO EXPERIENCE FLOODINGS IN THE LATE 1970'S WHEN THE DUTCH DELTA PLAN NEARED COMPLETION. IN VIEW OF THIS, THE CLASSIFICATION OF THE EXPOSURE AS BEING SEVERE IS JUSTIFIED. THE CONTAINER TERMINAL MANAGEMENT HOWEVER IDENTIFIED THIS EXPOSURE AND WAS ABLE, BEFORE CONSTRUCTION OF THE TERMINAL, TO TAKE APPROPRIATE MEASURES. THE MEASURES CONSISTED IN SLOPING THE CONTAINER PARKING AREA TO SUCH A HEIGHT THAT IT MET THE HEIGHTS OF THE DELTA OR SIGMA PLAN AS USED FOR THE RIVER "SCHELDE". ONCE THIS HEIGHT WAS REACHED, IT WAS DECIDED TO BUILD THE WORKSHOP AND EDP FACILITIES AT

THIS HEIGHT. IT WAS ALSO DECIDED NOT TO PUT THE EDP FACILITIES ON GROUND FLOOR BUT RATHER UP TO THE FIRST FLOOR JUST TO REDUCE THE EXISTING FLOODING EXPOSURE ADDITIONALLY.

TAKING INTO ACCOUNT THAT THE SLOPED CONTAINER TERMINAL CAN BE CONSIDERED AS A SORT OF VERY WIDE DIKE, IT IS OBVIOUS THAT CABLE ALLEYS OR CABLE BASEMENTS OR CABLE CORRIDORS COULD NOT BE INSTALLED IN THE SLOPED CONTAINER AREA SINCE THAT WOULD IMPLY THAT YOU WOULD STICK A PIPE THROUGH THE DIKE AND THEREBY DEFEAT THE ENTIRE PURPOSE OF THIS DIKE. CONSEQUENTLY, ALL ELECTRICAL CABLING, BE THIS HIGH POWER OR BE THIS ELECTRONIC DATA TRANSFER CABLING, IS INSTALLED IN WATER LOCKED AND SEALED CONDUITS. THE REMAINDER OF THE ENTIRE BUILDING HAS ALSO BEEN PROVIDED WITH A SUBSTANTIAL SEWAGE OR DRAINAGE SYSTEM THAT DRAINS POSSIBLE WATER THAT MIGHT COME OVER THE DELTA HEIGHT LEVEL DIRECTLY TO THE LOWER AREA AT THE BACK OF THESE BUILDINGS. I WANT TO RE-EMPHASIZE THAT ONCE THE WATER PASSES DELTA HEIGHT OR SIGMA HEIGHT, MAJOR AREAS OF BELGIUM AND THE NETHERLANDS WILL BE FLOODED AND CONSEQUENTLY WILL THEN BE TREATED AS A NATURAL DISASTER FOR WHICH RISK MANAGEMENT TECHNIQUES ARE LIMITED TO NOTHING.

THE THIRD EXPOSURE THAT WE'D LIKE TO DISCUSS IN DETAIL FOR THE WORKSHOP/EDP COMPLEX IS IMPACT. INDEED, A CONTAINER TERMINAL OPERATOR LIVES BY GRACE OF

MOVING CONTAINERS FROM TRUCKS ONTO CONTAINER PARKING LOTS AND FROM PARKING LOTS ONTO THE VESSELS AND VICE VERSA. THIS IMPLIES A RATHER LARGE NUMBER OF STRADDLE CARRIERS, LIFTTRUCKS, ETC, THAT IS MOVING AROUND ON THE CONTAINER TERMINAL AREA WITH THE CONSEQUENT EXPOSURE OF EQUIPMENT HITTING PROPERTY AND CONTAINERS. TAKING INTO ACCOUNT THE CONSTRUCTION OF A STRADDLE CARRIER AND THE DIFFICULTIES CREATED TO THE VISIBILITY OF THE DRIVER BY THE STRUCTURE OF THE STRADDLE CARRIER, LOCAL RISK MANAGEMENT HAS CHOSEN THE SOLUTION TO PROTECT BOTH THE WORKSHOP AND THE EDP FACILITY BY CONCRETE NEWTON BLOCKS THAT ARE INSTALLED ALL AROUND THE EXPOSED SIDES OF THE BUILDING. [A CONCRETE NEWTON BLOCK IS A CONCRETE BLOCK THAT IS SITTING FREELY ON THE SURFACE, HAS A HEIGHT OF ABOUT 1 METER, A LENGTH OF ABOUT 1 METER AND A WIDTH OF ABOUT 40 CENTIMETERS.] IF THESE NEWTON BLOCKS ARE HIT BY A STRADDLE CARRIER, THEY MAY GET SLIGHTLY DISPLACED BUT THEY WILL NOT CAUSE DAMAGE TO THE BUILDING NOR THE STRADDLE CARRIER ITSELF.

IN ADDITION, LOCAL MANAGEMENT HAS DECIDED NOT TO ALLOW THE REGULAR STRADDLE CARRIER DRIVERS TO DRIVING THE STRADDLE CARRIER INTO THE WORKSHOP BUT RATHER HAVE THEM PARK THE STRADDLE CARRIER IN A CENTRAL PARKING AREA AND THE MECHANIC WHO WILL CARRY OUT THE PREVENTIVE MAINTENANCE WILL COLLECT AND DRIVE THE STRADDLE CARRIER INTO THE WORKSHOP.

THE LAST EXPOSURE THAT WE WANT TO DISCUSS FOR THIS FACILITY IS THE STORM EXPOSURE.

THE STORM EXPOSURE IS CONSIDERED MODERATE TAKING INTO ACCOUNT THAT THESE BUILDINGS ARE PRETTY CLOSE TO THE OPEN SEA FRONT HOWEVER, THE BUILDINGS ARE NOT CONSTRUCTED TO A HEIGHT THAT WOULD START BEING ALARMING. SPECIAL PRECAUTIONS HOWEVER HAVE BEEN TAKEN FOR THE LARGE ENTRANCE DOORS TO THE WORKSHOP, THAT ARE ABOUT 12 METERS HIGH AND 4 METERS WIDE. OBVIOUSLY THESE ROLLING SHUTTER DOORS HAVE BEEN SPECIALLY REINFORCED TO COPE WITH WIND SPEEDS UP TO 12 BEAUFORT WHICH IS ROUGHLY 30 METERS PER SECOND. IT IS ALSO ASSURED THAT THE MAIN ENTRANCE DOORS ARE INSTALLED IN THAT PART OF THE BUILDING THAT IS IN THE LEEWARD SIDE OF THE MOST PREVAILING WINDS.

THE NEXT PROPERTY ITEM THAT IS DISCUSSED ARE THE UTILITIES, WITH UTILITIES IN THIS PARTICULAR CASE WE REFER TO THE TWO 16 MVA TRANSFORMERS THAT ARE INSTALLED IN THE OPEN AND TO THE SWITCHGEAR BUILDING. THE OCCUPANCY IS PRETTY SIMPLE, TWO MINERAL OIL COOLED MAIN TRANSFORMERS OF WHICH ONE IS STANDBY AND A SWITCHGEAR HOUSE THAT IS DIVIDED INTO TWO SECTIONS JUST FOR REDUNDANCY REASONS. [IN ORDER TO PREVENT POSSIBLE POLLUTION, NO PCB CONTAINING EQUIPMENT HAS BEEN INSTALLED FOR THIS FACILITY.]

THE FIRE EXPOSURE CREATED TO AND BY THE TRANSFORMER ITSELF IS A TRUE EXPOSURE TO THE ENTIRE OPERATIONS. IT SHOULD BE NOTED THAT NO CONTAINER WILL BE LIFTED ON OR FROM A VESSEL UNLESS THERE IS SUFFICIENT ELECTRICAL ENERGY AVAILABLE. APART FROM THE NORMAL LOCAL LEGISLATION THAT ASKS FOR THE INSTALLATION OF A BUCHOLD RELAYS, INTERRUPTABLE CIRCUIT BREAKERS, WITH FUSED CONNECTIONS BOTH ON A HIGH TENSION AND THE LOW TENSION SIDE, WITH A SUPERVISION OF HIGH TEMPERATURE AND EARTH FAILURE, A FIRE AND BLAST RESISTIVE WALL HAS BEEN CONSTRUCTED BETWEEN THE TWO TRANSFORMERS TO IN CASE OF A CALAMITY WITH ONE TRANSFORMER PREVENT THE SECOND TRANSFORMER FROM BEING DAMAGED. AS ONE OF THE TRANSFORMERS IS ON STANDBY, LOCAL MANAGEMENT HAS DECIDED TO REGULARLY SWITCH FROM TRANSFORMER IN ORDER TO HAVE A SIMILAR WEAR PATTERN. SIMULTANEOUSLY A PREVENTIVE MAINTENANCE PROGRAM IS IN PLACE THAT ANALYZES THE QUALITY OF THE DIELECTRIC OIL ON AN ANNUAL BASIS. THE FIRE EXPOSURE OF THE UTILITY BUILDING IS MINIMAL SINCE THE COMBUSTIBLE LOAD INSIDE IS KEPT TO THE BASIC MINIMUM BEING THE CABLES AND AN INSTALLATION BOARD. IN ADDITION, MANAGEMENT HAS PROVIDED AN INSTALLATION OF SMOKE DETECTORS THAT SHOULD DETECT AND TRIP AN EARLY FIRE WARNING. ALSO THE UTILITY BUILDING HAS BEEN CUT IN TWO, WITH CONTROLS AND EQUIPMENT IN EACH OF THE TWO AREAS TO CONTROL THE TRANSFORMERS INDIVIDUALLY. THE FLOOD HAZARD FOR THIS FACILITY IS MINIMAL SINCE IT IS ALSO INSTALLED OVER THE DELTA OR SIGMA HEIGHT. THE IMPACT HAZARD CAN BE RATED "LOW"

SINCE THIS IS AN AREA THAT IS NOT ACCESSIBLE TO EITHER STRADDLE CARRIERS, LIFTTRUCKS OR OTHER VEHICLES. THE STORM EXPOSURE FOR THIS UNIT IS ALSO LOW SINCE WE ARE TALKING ABOUT TRULY LOW STRUCTURES (MAXIMUM 4 METERS HEIGHT).

THE THIRD PROPERTY ITEM ON OUR LIST IS THE CRANES AND CARRIERS.

PRESENTLY FOUR CRANES ARE INSTALLED AND SOME TWENTY-FIVE STRADDLE CARRIERS ARE DRIVING AROUND.

THE FIRE EXPOSURE FOR THE STRADDLE CARRIERS IS EQUIVALENT TO THAT OF A NORMAL TRUCK SINCE THE STRADDLE CARRIER IS OPERATED BY MEANS OF TWO DIESEL ENGINES. APART FROM THE REGULAR PORTABLE FIRE EXTINGUISHER THAT IS AVAILABLE IN THE CABIN OF THE STRADDLE CARRIER AND THE ONE ON ONE OF THE LEGS OF THE STRADDLE CARRIER NO OTHER MEANS ARE PROVIDED. IN ORDER TO REDUCE THE EXPOSURE OF STRADDLE CARRIERS ONCE THEY ARE PARKED DURING NON OPERATIONAL HOURS, MANAGEMENT HAS DECIDED TO LEAVE A FREE SPACE OF AT LEAST 4 METERS BETWEEN THE STRADDLE CARRIERS WHICH WOULD ALLOW FIRE FIGHTING OPERATIONS TO TAKE PLACE IF FOR ONE OR OTHER REASON THE STRADDLE CARRIER WOULD CATCH FIRE AND TO REDUCE THE EXPOSURE FROM STRADDLE CARRIER TO STRADDLE CARRIER.

THE FIRE HAZARD FOR THE CRANES IS A MORE COMPLICATED ISSUE, TAKING INTO ACCOUNT THAT THESE MAJOR CRANES HAVE HOISTING CAPACITIES OF [70 TONS] AND ARE COMPLETELY ELECTRICALLY DRIVEN. THE CRANES ARE SUPPLIED WITH A 15 KV TENSION WHICH IS

REDUCED BY A TRANSFORMER INSTALLED IN THE MECHANICAL AREA OF THE CRANE. TAKING INTO ACCOUNT THE CONSTRUCTION OF THE CRANE HAVING A MOVABLE OPERATORS CABIN (GONDOLA) AND A FIXED AREA WHERE THE ELECTRIC MOTORS AND TRANSFORMER (THIS TRANSFORMER IS STILL SIZED 2,500 KVA, SUFFICIENT TO SUPPLY ANY MEDIUM SIZED FACTORY) ARE FIXED AT A LEVEL OF ± 45 OR 50 METERS STATIONARY IN TOP OF THE CRANE. TO MAINTAIN CONTROL OF THE FIRE EXPOSURE CREATED BY THIS ELECTRICAL INSTALLATION, SMOKE DETECTORS HAVE BEEN INSTALLED IN THE MECHANICAL AND ELECTRICAL AREAS OF THE CRANE WHICH TRIGGER AN ALARM IN THE OPERATOR'S CABIN AND THE TECHNICAL SUPERVISOR'S OFFICE OF THE WORKSHOP.

1. IN VIEW OF THE FREQUENT PRESENCE OF PEOPLE IN THIS ELECTRICAL/ MECHANICAL AREA, A FIXED EXTINGUISHING INSTALLATION OF CO_2 CANNOT BE USED.

2. IN VIEW OF THE ENVIRONMENTAL CONCERNS ABOUT THE OZON LAYER, IT WAS DECIDED NOT TO INSTALL A HALON SYSTEM AND IN VIEW OF THE INABILITY TO INSTALL A SPRINKLER SYSTEM IN THIS AREA, MANAGEMENT HAS DECIDED TO HAVE THE CRANE OPERATORS PROPERLY TRAINED IN THE USE OF FIRE EXTINGUISHERS AND FIRE FIGHTING TECHNIQUES.

FLOOD :

THE FLOOD EXPOSURE FOR THE STRADDLE CARRIERS IS IN PRINCIPLE NIL SINCE THEY ARE MOVABLE AND THEY CAN BE, IF NECESSARY, MOVED AWAY FROM THE CONTAINER TERMINAL.

THE FLOOD EXPOSURE FOR THE CRANES IS EXISTING HOWEVER IS RATED "LOW" TO "MODERATE" SINCE IT WOULD ONLY BE THE TRANSPORT MECHANISM ON THE WHEELS THAT WOULD BE FLOODED WITH WATER AND WOULD NEED CLEANING AND DRYING, THE REPLACING DOWNTIME WOULD BE APPROXIMATE1Y 5 DAYS/CRANE.

THE ELECTRICAL CONNECTIONS SUPPLYING HIGH TENSION POWER TO THE CRANES ARE ALL INSTALLED IN WATER-PROOF, WATER-LOCKED COMPARTMENTS.

THE IMPACT HAZARD THAT EXISTS FOR STRADDLE CARRIERS IS RATED "HIGH" TO "SEVERE". INDEED, STRADDLE CARRIERS ARE BEHAVING LIKE REGULAR TRAFFIC BUT HAVE THE ADDITIONAL DIFFICULTY THAT THE VISION OF THE STRADDLE CARRIER OPERATORS MAY BE SEVERELY HAMPERED BY CONTAINERS BEING CARRIED AND AS A CONSEQUENCE STRADDLE CARRIER ACCIDENTS WHERE STRADDLE CARRIERS STRUCK AGAINST CONTAINERS OR WHERE STRADDLE CARRIERS STRUCK OTHER MOVING VEHICLES [STRADDLE CARRIERS OR LIFTTRUCKS] HAVE ALREADY OCCURRED. THE SOLE WAY OF ADDRESSING THIS PROBLEM IS HAVING A LAYOUT OF THE FACILITY THAT PREVENTS AS FAR AS POSSIBLE MOVING EQUIPMENT TO MOVE IN COUNTERDIRECTIONS OR CROSS-ROAD DIRECTIONS. THIS RISK MANAGEMENT TECHNIQUE IS

ONE THAT WILL NEVER EVER BE ABLE TO EXCLUDE OR PREVENT ACCIDENTS, IT IS HOWEVER A PREVENTIVE WAY AND WILL BE FURTHER REFINED BY TRAINING OF STRADDLE CARRIER OPERATORS.

THE IMPACT FOR THE CRANES HAS BEEN TREATED DIFFERENTLY. THE HAZARD OF TWO CRANES COLLIDING WITH EACH OTHER IS A RISK THAT COULD IN THIS PARTICULAR CASE, NOT BE ASSUMED TAKING INTO ACCOUNT THE VALUE OF A CRANE OF BEING APPROXIMATELY 200,000,000 BF/UNIT. NOT ACCEPTING THIS RISK, THE DECISION WAS TAKEN TO LOOK FOR PROTECTION TO PREVENT AFOREMENTIONED COLLISION OF CRANES.

THE SOLUTION FOUND AND SELECTED FOR IS A DOUBLE ONE, NAMELY :

A. THE CRANES ARE ALL PROVIDED WITH SENSORS THAT SHIFT THE CRANE BACK TO A MINIMUM SPEED ONCE THESE SENSORS ARE ACTIVATED AND SOUND AN ALARM IN THE OPERATOR CABIN. [SENSOR ACTIVATE WHEN CRANES ARE CLOSER THAN 5 METERS.]

B. THE CRANES ARE PROVIDED WITH HYDRAULIC BUMPERS THAT ARE CALCULATED TO ABSORB IMPACT ENERGY CREATED WHEN THE TWO CRANES HIT EACH OTHER BOTH DRIVING AT THIS MINIMAL SPEED.

THEREFORE, THE IMPACT EXPOSURE IS CONSIDERED TO BE REDUCED TO MINIMAL FOR THE CRANES. IT GOES WITHOUT SAYING THAT BOTH BUMPERS AS WELL AS DETECTORS ARE SUBJECT TO A PREVENTIVE MAINTENANCE PROGRAM AND THAT ONCE EVERY SIX MONTHS THE

ACTUAL FUNCTIONING OF THESE DETECTORS IS TESTED AND SO FAR SO GOOD.

THE STORM EXPOSURE FOR THE STRADDLE CARRIERS IS NOT CONSIDERED VERY HIGH DUE TO THE RATHER LOW HEIGHT OF THESE CARRIERS PLUS THAT THESE CARRIERS CAN, IN CASES OF SEVERE STORMS, BE PARKED IN LEEWARD AREAS.

FOR CRANES HOWEVER, THIS STORM EXPOSURE IS A LARGE ONE. THE CRANES HAVE BEEN CONSTRUCTED TO BE ABLE TO CONTINUE OPERATING, LOADING AND UNLOADING CONTAINERS FROM THE HOLD AREAS OF VESSELS UP TO A WIND SPEED OF 10 BEAUFORT. ONCE THE SPEED OF 10 BEAUFORT IS EXCEEDED, OPERATIONS ARE CEASED AND CRANES ARE BROUGHT TO PARKING CONDITION WHICH IMPLIES THAT EACH CRANE IS ANCHORED TO THE QUAY BY MEANS OF STORM PINS. THESE STORM PINS ARE USED AS A MATTER OF FACT CONTINUOUSLY SINCE IT IS A STANDING INSTRUCTION THAT ONCE A CRANE IS PARKED, IT IS PARKED WITH THE STORM PINS ENGAGED. ALSO, AS A DOUBLE CHECK, ONCE WIND STARTS TO BLOW, A FOREMAN OF THE MAINTENANCE DEPARTMENT IS CHARGED WITH THE VERIFICATION THAT INDEED ALL STORM PINS ARE DOWN.

THE FOURTH AND LAST ITEM OF THE PROPERTY THAT WILL BE DISCUSSED IS THE OFFICE BLOCK LOCATED IMMEDIATELY AT THE WATER FRONT.

THE OCCUPANCY OF THIS FOUR STOREY OFFICE BUILDING CONSISTS SOLELY OF ADMINISTRATIVE FUNCTIONS. NONE OF THE FUNCTIONS PRESENT IN THIS BUILDING WOULD, IF IMPAIRED, JEOPARDIZE THE OPERATION OF THE CONTAINER TERMINAL. THE FIRE EXPOSURE IS RATED "LOW" TO "MODERATE" SINCE THE COMBUSTIBLE LOAD IS EQUIVALENT TO ANY OTHER OFFICE OCCUPANCY. PROTECTION MEANS INSTALLED CONSIST OF PORTABLE FIRE EXTINGUISHERS AND A SYSTEM OF INSIDE HOSE REELS. ALSO, THIS BUILDING HAS BEEN PROVIDED WITH A SYSTEM OF ALARM PUSH-BUTTONS HOOKED UP TO THE WORKSHOP/EDP UNIT AND TO THE PUBLIC FIRE DEPARTMENT.

THE FLOOD EXPOSURE IS RATED "MODERATE" TO "HIGH".

INDEED, IF THE RIVER "SCHELDE" HAS A SPRING TIDE, THIS OFFICE BUILDING MAY GET FLOODED ON THE GROUND FLOOR LEVEL. IT SHOULD BE NOTED THAT THE GROUND FLOOR IN THIS PARTICULAR BUILDING ONLY CONSISTS OF A CANTEEN AND OF LOCKER ROOMS.

THE IMPACT EXPOSURE EXISTS FOR THIS BUILDING, SINCE AS STATED BEFORE, THIS BUILDING IS LOCATED AT THE WATER FRONT AND AS WE HAVE SEEN FROM THE SLIDE AT THE BEGINNING OF THE PRESENTATION, IT IS LOCATED CLOSE TO THE CONTAINER PARKING AREA AND CONSEQUENTLY THERE IS QUITE SOME MOVEMENT OF STRADDLE CARRIERS CLOSE TO THIS OFFICE BUILDING.

ACTIONS TAKEN TO REDUCE THE EXPOSURE ARE TWO-FOLD :

A. A ROW OF CONCRETE NEWTON BLOCKS SIMILAR TO THE ONES THAT ARE PUT AROUND THE EDP/WORKSHOP AREA HAS BEEN PROVIDED AROUND THIS OFFICE BUILDING.

B. THE ROUTING OF STRADDLE CARRIERS AND PARKING OF CONTAINERS IS DONE IN SUCH A WAY THAT THE STRADDLE CARRIER NEVER APPROACHES THE OFFICE BUILDING PERPENDICULARLY BUT RATHER ALWAYS PARALLEL.

THE NEXT ITEM THAT I WOULD LIKE TO ADDRESS IS THE BUSINESS INTERRUPTION BECAUSE IT IS TRUE THAT PROFITS ARE NOT REALLY JEOPARDIZED BY DAMAGE TO PROPERTY HOWEVER, THEY ARE JEOPARDIZED BY INTERRUPTION TO THE OPERATIONS.

THE PARTICULAR WAY OF TRANSPORTING GOODS IN CONTAINER PUTS A HIGH EMPHASIS ON TIMELY LOADING AND UNLOADING, BE THIS FROM FACTORY TO TRUCK, FROM TRUCK TO CONTAINER TERMINAL, FROM TERMINAL TO BOAT, OR VICE VERSA.

A BUSINESS INTERRUPTION CAN BE CREATED BY A FIRE IN THE WORKSHOP AREA, THE EDP AREA, THE UTILITIES AREA AND IN THE CRANE'S UTILITIES AND MECHANICAL AREAS. ASSESSMENT OF THE FIRE EXPOSURE IN THE WORKSHOP TAUGHT US THAT THIS RISK IS MINIMAL SINCE THE HESSENATIE OPERATES OTHER OFF-SITE STRADDLE CARRIER REPAIR/MAINTENANCE SHOPS WHICH WOULD IN THE CASE OF NECESSITY BE ABLE TO MAINTAIN THE STRADDLE CARRIERS THAT ARE PRESENTLY DEPLOYED IN THIS CONTAINER TERMINAL.

THE FIRE EXPOSURE TO THE ELECTRONIC DATA PROCESSING AREA HAS BEEN PROTECTED APPROPRIATELY LOCALLY, BUT THE ELECTRONIC DATA PROCESSING UNIT IS ALSO BACKED-UP BY TWO OTHER MAIN FRAMES THAT ARE LOCATED IN THE ADMINISTRATIVE HEAD OFFICE OF THE CONTAINER OPERATOR IN THE CENTER OF ANTWERP AND ONE LOCATED AT ONE OF THE OTHER TERMINALS THAT ARE CONTROLLED AND OPERATED BY THE HESSENATIE. INDEED, FIXED DOUBLE CABLING HAS BEEN INSTALLED BETWEEN THE THREE COMPUTERS AND THIS ARRANGEMENT WILL ALLOW THAT THE CONTAINER TERMINAL CAN CONTINUE OPERATING IF ANY TWO OF THE THREE COMPUTERS WILL BE OUT OF SERVICE. CONSEQUENTLY, IT IS CONSIDERED THAT THE RISK CREATED BY A BREAKDOWN OF THE EDP CAPACITY AT THIS FACILITY HAS BEEN REDUCED TO ACCEPTABLE LEVELS. ALTHOUGH IT SHOULD BE REALIZED THAT OPERATIONS ARE SEVERELY HAMPERED IF THE TERMINAL UNIT IS OUT OF OPERATION.

TO RECAPITULATE, ACTIONS TAKEN TO PREVENT/REDUCE THE B.I. EXPOSURE FOR THE EDP UNIT ARE :

- EDP PROPERLY CUT-OFF FROM NEARBY EXPOSING OCCUPANCIES
- USE OF LOW FLAME SPREAD CABLING - AUTOMATIC FIRE PROTECTION REDUNDANCY
- UNINTERRUPTED POWER SUPPLY WITH A 1 HOUR CAPACITY

THE ELECTRICAL UTILITIES ARE VERY, VERY IMPORTANT TO THE CONTINUITY OF OPERATIONS OF THIS TERMINAL. THIS WAS IDENTIFIED AND THE ENTIRE ELECTRICAL INSTALLATION GOT INSTALLED IN SUCH A WAY THAT REDUNDANCY WAS SECURED. INDEED, TWO 16 MVA TRANSFORMERS HAVE BEEN INSTALLED NEXT TO EACH OTHER, SEPARATED BY A FIRE RESISTIVE, BLAST RESISTIVE WALL. CONTROLS ARE ALL DUPLICATED WHICH ALLOWS, IF ONE OF THE TWO MAIN TRANSFORMERS GOES DOWN, THAT INDEPENDENTLY OF THE DOWN TRANSFORMER, THE STANDBY TRANSFORMER CAN BE LOCKED IN. THE UNDERGROUND ELECTRICAL CABLING IS INSTALLED AS A RING MAIN SYSTEM WITH SECTIONAL CONTROLS. THIS ALLOWS MANAGEMENT, IN CASE OF DAMAGE TO THIS UNDERGROUND MAIN, TO ISOLATE DAMAGED SECTIONS BUT CONTINUE OPERATIONS. ELECTRICAL SUPPLY FROM THE PUBLIC UTILITIES HAVE BEEN DOUBLED ALSO. THE CONTAINER TERMINAL IS ONCE SUPPLIED FROM THE CITY SIDE ON A 36 KV LINE AND SIMULTANEOUSLY IS ALSO SUPPLIED FROM THE NUCLEAR REACTOR SIDE ON A 36 KV SUPPLY. IT SHOULD BE NOTED THAT THE "CITY SUPPLY" IS COMING FROM ANOTHER SOURCE THAN THE 36,000 V NUCLEAR CENTRAL SUPPLY.

A FIRE OCCURRING IN ONE OF THE FOUR CRANES WOULD INDEED CREATE A BUSINESS INTERRUPTION. IT IS ASSESSED THAT THIS BUSINESS INTERRUPTION WILL BE LIMITED TO LESS THAN 1/4 OF THE TOTAL CAPACITY SINCE PRESENTLY FOUR CRANES ARE INSTALLED AND A MOBILE CONTAINER CRANE PRESENT ON THE HESSENATIE BARCH TERMINAL CAN BE USED.

THIS INTERRUPTION EXPOSURE WILL BE FURTHER REDUCED IN FUTURE WHEN TWO ADDITIONAL CRANES WILL BE ADDED NEXT YEAR, CONSEQUENTLY, BUSINESS INTERRUPTION EXPOSURE WILL BE DOWN TO 16 %. TO GET A HANDLE ON THIS < 25 % or 16 %, MANAGEMENT DECIDED TO INSTALL AN EARLY FIRE WARNING SYSTEM IN THOSE AREAS WHERE A TECHNICAL FIRE HAZARD EXISTED AND INSTALLED COLLISION PROTECTION.

THE BUSINESS INTERRUPTION CREATED BY FLOOD ALSO EXISTS, HOWEVER IT IS CONSIDERED MINIMAL. INDEED, IF THE CONTAINER TERMINAL GETS FLOODED, DAMAGES MAY OCCUR TO FLOATING CONTAINERS, HOWEVER, ONCE THE FLOODING HAS CEASED, THE TERMINAL WILL BE ABLE TO RATHER EASILY REGAIN OPERATIONS.

THE BUSINESS INTERRUPTION CREATED BY IMPACT IS CONSIDERED TO BE PROPERLY COVERED SINCE INSTALLATIONS HAVE BEEN MADE AND ARE REGULARLY VERIFIED TO PREVENT THE CRANES FROM RUNNING INTO EACH OTHER AT A UNCONTROLLED SPEED.

THE BUSINESS INTERRUPTION HAZARD CREATED BY STORM IS A HAZARD THAT EXISTS FOR ALL CRANE OPERATOR IN THE ANTWERP AREA. THE CRANES INSTALLED ON THIS TERMINAL WILL RECEIVE SIMILAR WIND LOADS AS CRANES THAT ARE INSTALLED 500 M UPSTREAM OR 500 M INTO THE HARBOUR AREA. IT IS OUR OPINION THAT MANAGING THE RISK OF STORM FOR THIS KIND OF CRANES IS ONLY POSSIBLE DURING THE DESIGN AND CONCEPTION PHASE OF THESE CRANES WHICH IMPLIES THAT CRANES ARE BUILT TO WITHSTAND WINDSTORMS OF SIZES

THAT VERY RARELY, [ONCE EVERY 80 OR 100 YEARS] OCCUR IN THAT AREA WHICH HAS BEEN DONE BY THE HESSENATIE MANAGEMENT. THE PREVENTIVE ACTION PLANS THAT INSTRUCT THE CRANE OPERATOR TO LOWER HIS STORM PINS ANY TIME WHEN HE PARKS HIS CRANE AND THE FACT THAT A SECOND CHECK IS MADE BY A FOREMAN AT THE TIME THAT IT STARTS BLOWING INDEED TELLS US THAT THIS IS THE MAXIMUM THAT IS DONE TO MANAGE THE RISK.

THERE ARE HOWEVER ALSO SEVERAL ITEMS THAT MAY CAUSE A BUSINESS INTERRUPTION BUT FOR WHICH NO LOSS PREVENTION MEASURES CAN BE TAKEN. ITEMS LIKE THIS INCLUDE A STRIKE OF CUSTOMS WHICH WILL IMPLY THAT NO CONTAINER COULD BE IMPORTED OR EXPORTED OUT OF BELGIUM. AS THE INDUSTRIAL AREA ALONG BOTH SIDES OF THE "SCHELDE" IS AN AREA IN WHICH QUITE SOME LARGE CHEMICAL INDUSTRY IS LOCATED, LIKE BAYER, BASF, EXXON REFINERIES, BRC, ETC, IT COULD BE WELL POSSIBLE THAT AN ACCIDENTAL RELEASE OF A TOXIC OR CORROSIVE SUBSTANCE COULD OCCUR. IF THIS WOULD OCCUR, IT COULD TRIGGER ONE OF THE ALARM PLANS THAT EXIST IN THE ANTWERP HARBOUR AREA AND MAY LEAD TO AN EVACUATION OF THE AREA. THE RISK THAT THIS WOULD OCCUR HAS BEEN EVALUATED, IT HAS NOT OCCURRED OVER THE PAST 18 YEARS AND CONSEQUENTLY IS CONSIDERED A RISK TO ACCEPT BY THE OPERATOR. [THIS RISK APPLIES ALSO TO ALL OTHER "OPERATORS" IN THE "SCHELDE" HARBOUR.]

A SIMILAR ITEM COULD BE A COLLISION BETWEEN BOATS ON THE RIVER "SCHELDE".

INDEED, IF A TANKER LOADED WITH A GAS OR LIQUID WOULD COLLIDE WITH ANOTHER BOAT IN FRONT OF OR CLOSE TO THE TERMINAL, OPERATIONS WOULD CEASE. IT IS EXPECTED THAT IF AN ISSUE LIKE POLLUTION OR COLLISION OF BOATS OCCURS THAT THE BUSINESS INTERRUPTION WILL BE LIMITED TO SOME 48 OR 72 HOURS.

I AM NOW GLAD TO REINTRODUCE MY PARTNER, MR. ROGER MESDAGH, WHO WILL CONTINUE TO DISCUSS DETAILS ON EXPOSURES ON WORKMAN'S COMPENSATION AND LIABILITY OF THIS CONTAINER TERMINAL. THANK YOU.

WORKMAN'S COMPENSATION

THE MAJOR SPECIFIC RISKS IDENTIFIED IN RELATION TO EMPLOYEES ARE :

1. DROWNED PERSONS IN THE RIVER;

2. HANDLING DANGEROUS CARGO;

3. OPERATING IN CIRCUMSTANCES THAT ARE NOT ADAPTED TO HUMAN STANDARDS.

EVALUATION OF THE RISKS IDENTIFIED AND TECHNIQUES USED FOR REDUCTION.

1. DROWNED PERSONS IN THE RIVER

AS FROM THE EXPERIENCE IN OUR OWN COMPANY OPERATING 10 TERMINALS IN THE PORT, THE FREQUENCY OF THIS KIND OF ACCIDENT IS TO BE CONSIDERED LOW : LESS THAN ONE PERSON OVER A 5 YEAR PERIOD. SEVERITY HOWEVER IS CONSIDERED VERY HIGH DUE TO THE TIDAL SPEEDS THAT CAN REACH ABOUT 2 M/SEC.

AFTER INVESTIGATING DIFFERENT RESCUE POSSIBILITIES (LIKE OWN MOTORCRAFT) THE MOST REALISTIC SOLUTION CONSISTED IN AN AGREEMENT WITH THE COMPANY OPERATING A PILOT STATION NEXT TO OUR TERMINAL. THIS

COMPANY HAS TUGBOATS IN OPERATIONAL STANDBY CONTINUOUSLY. BY RADIO COMMUNICATION ON THEIR "HOT FREQUENCY" THEY CAN INTERVENE WITHIN 60 SECONDS AFTER ALARM. THIS PROCEDURE IS REGULARLY TESTED TO BE SURE IT REMAINS OPERATIONAL.

2. HANDLING OF DANGEROUS CARGO

ABOUT 5 % OF ALL VOLUMES HANDLED ON THE CONTAINER TERMINAL ARE TO BE CONSIDERED DANGEROUS CARGO. AS IN GENERAL THE TERMINAL OPERATOR PEOPLE ARE NO CHEMISTS AND ARE NOT FAMILIAR WITH HANDLING THESE THOUSANDS OF COMMODITIES. THE RISK REDUCTION PROGRAM IS BASED ON THE FOLLOWING PRINCIPLES :

A) ESTABLISHING STANDARD SAFETY PROCEDURES;

B) EDUCATION AND TRAINING OF ALL PEOPLE INVOLVED;

C) APPOINTMENT OF AN IMO-SAFETY OFFICER;

D) INTEGRATING ALL NECESSARY INFORMATION ON IMO-CARGO IN THE INFORMATION SYSTEMS.

A) THE STANDARD SAFETY PROCEDURES INCLUDE AMONGST OTHERS :

- CAREFUL INSPECTION OF ALL IMO-CARGO PRESENTED AT THE TERMINAL AND REFUSAL FOR HANDLING IF THERE IS THE SLIGHTEST PRESUMPTION OF DEFECTIVE CARGO OR PACKAGING.

  NEXT TO THE ENTRY GATES, BUT STILL OUTSIDE THE PREMISES HN HAS PROVIDED & A SPECIFIC DIKED AREA WHERE ALL SUCH DUBIOUS CARGO CAN BE PARKED AWAITING THE TIME OF ITS REMOVAL BY AUTHORIZED PEOPLE.

- SAFETY KITS IN EVERY BUILDING OF THE TERMINAL.

- IMO-MANUAL INCLUDING THE EMERGENCY PLANNING SCHEME.

B) EDUCATION AND TRAINING

- OUTSIDE CONSULTANTS PROVIDE ALL STAFF PEOPLE WITH AN OVERALL EDUCATION ON DANGEROUS CARGO (1 DAY A YEAR).

- TRAINING ON INSTRUCTIONS AND PROCEDURES (SEE IMO MANUAL) FOR ALL PEOPLE INVOLVED IN OPERATIONS (TWICE A YEAR ½ DAY).

C) IMO SAFETY OFFICER

A LOCAL STAFF MEMBER HAS BEEN SELECTED AS IMO SAFETY OFFICER.

HIS ROLE IS :

- TO ESTABLISH ALL IMO PROCEDURES;
- TO KEEP THE IMO MANUAL UP TO DATE;
- TO DO SAMPLE CONTROLS ON OPERATIONS AND ASSURE THE IMO PROCEDURES ARE BEING FOLLOWED.

HE IS BACKED UP BY AN ASSISTANT WHO MUST BE ABLE TO TAKE HIS PLACE. THE IMO OFFICER REPORTS IMMEDIATELY TO THE TERMINAL MANAGER.

D) INFORMATION SYSTEM

ALL DATA ON CARGO AND OPERATIONS ON THE TERMINAL ARE PUT IN THE COMPUTER SYSTEM. ALL REGULATIONS AND PROCEDURES ON IMO CARGO HAVE BEEN INTEGRATED IN THIS SYSTEM TO HELP OPERATIONAL PEOPLE PERFORM BETTER AND TO PROVIDE AN ADEQUATE AND EASY MEAN ON THE CONTROL OF THE PROCEDURES SUCH AS :

- IMO REGULATION REQUIREMENTS ON LABELING AND PACKAGING;
- STUFFING AND STORAGE ON THE PARKING ZONES OF NON COMPATIBLE COMMODITIES.

NEEDLESS TO SAY IT IS THE IMO OFFICER'S RESPONSIBILITY TO KEEP THE INFORMATION SYSTEM UPDATED.

3. OPERATING ENVIRONMENT BEYOND HUMAN PROPORTIONS

DESPITE ALL COMPUTER SYSTEMS AND THE HIGH DEGREE OF AUTOMATION THE TERMINAL STILL NEEDS PEOPLE ON THE SPOT TO BE OPERATIONAL :

- TALLYMEN ON THE SHORE;
- DECKMEN;
- LASHING PEOPLE CLIMBING ON AND OFF THE CONTAINERS TO PUT OR TO REMOVE LASHING MATERIAL;
- CRANE DRIVERS;
- STRADDLE CARRIER DRIVERS.

IN ORDER TO PROTECT AS MUCH AS POSSIBLE OUR WORKMEN FOLLOWING RULES HAVE BEEN APPLIED BY DESIGNING THE LAYOUT AND THE ESTABLISHMENT OF THE OPERATIONS :

A) ABSOLUTE CONTROL ON ALL ACCESS POSSIBILITIES;

B) SEPARATE AS MUCH AS POSSIBLE THE DIFFERENT TRAFFIC MODI AND VEHICLE AND CARGO FLOWS;

C) USE OF ADVANCED TECHNOLOGY IN THE ADMINISTRATION FLOW AND COMMUNICATION SYSTEMS;

D) USE OF ERGONOMIC PRINCIPLES AT THE DESIGN OF THE OPERATING MACHINES.

A) 1. RAILS ARE CONCENTRATED AT THE LANDSIDE OF THE TERMINAL AND REALLY COMPLETELY SEPARATED FROM CRANE, STRADDLE CARRIER AND TRUCK MOVEMENTS. IN PRINCIPAL STRADDLE CARRIERS AND TRUCKS NEVER CROSS ROADS.

2. ANY TRANSPORT OF PERSONS IS PERFORMED BY A SPECIFIC TERMINAL BUS SERVICE. IT IS 24 HOURS A DAY AT THE DISPOSAL OF ANYONE THAT NEEDS TO BE ON THE PREMISES (LONGSHORE MEN, SAILORS, CUSTOMERS, ...).

B) 1. ALL NECESSARY INFORMATION ON THE CARGO IS COLLECTED AT THE GATES-IN AND FED INTO THE MAINFRAME BY THE GATESMEN. THIS

PRACTICE ENABLES SOFTWARE TO INDICATE AND REGISTER THE PARKING LOCATION ON THE TERMINAL.

2. THE STRADDLE CARRIERS AND FORKLIFTS HAVE AN ON-LINE MODEM LINK WITH THE COMPUTER. VIA A DISPLAY IN THE DRIVERS CABIN THEY RECEIVE THEIR OPERATING INSTRUCTIONS AND HAVE INPUT POSSIBILITIES VIA THIS CHANNEL.

3. ALL TALLYING OPERATIONS OCCUR AT THE GATES-IN OR OUT AND ALONGSIDE THE VESSEL. TALLYMEN USE PORTABLE COMPUTERS THAT HAVE A LINK WITH THE MAINFRAME.

4. THE ARRANGEMENT OF THIS INFORMATION SYSTEM AS IT WORKS TODAY ALLOWS ANYONE CONCERNED A DIRECT AND UPDATED ACCESS ON ALL RELEVANT DATA SUCH AS COMMODITY HANDLING PROCEDURE, EMERGENCY SYSTEMS, ETC.

5. TALLY PEOPLE WORKING ALONGSIDE A VESSEL SHOULD NEVER BE IN OR CROSS THE STRADDLE CARRIER OPERATING ZONE. THEY SHOULD BE IN

THE SHELTER CABINS ATTACHED ON THE CRANES.

D) FROM PREVIOUS EXPERIENCES, WE LEARNED ABOUT ERGONOMIC PROBLEMS IN STRADDLE CARRIERS AND CRANES.

THE COOPERATION BETWEEN RISK MANAGEMENT SERVICES, OWN WORKMEN SPECIALIST DRIVERS AND EQUIPMENT SUPPLIERS HAS ENABLED TO REALIZE MAJOR IMPROVEMENTS AND INNOVATIONS IN THE DESIGN OF DRIVER CABINS :

- MORE PRACTICAL ACCESSES TO THE MACHINES MINIMIZING THE RISKS OF SLIPPING AND FALLING FROM THE STAIRS (LIFTS FOR THE CRANES);
- ERGONOMIC DESIGN OF DRIVERS CABINS REDUCING THE FATIGUE AN WIDENING THE VISIBILITY.

LIABILITY

IN GENERAL A STEVEDORING TERMINAL CAN BE CONFRONTED WITH FOLLOWING LIABILITIES :

- DAMAGE TO THE CARGO;
- DAMAGE TO TRANSPORT MODI AND/OR THEIR EQUIPMENT;
- DAMAGE TO THIRD PARTIES AND/OR THEIR EQUIPMENT;
- CONSEQUENTIAL DAMAGES AND/OR BUSINESS INTERRUPTION RESULTING FROM ABOVE DAMAGES.

THE WORD DAMAGES STANDS FOR MATERIAL DAMAGES AS WELL AS INJURIES.

IN CASE OF THE SCHELDT CONTAINER TERMINAL WE HAVE IDENTIFIED FOLLOWING SPECIFIC RISKS IN ASSESSING OUR LIABILITY.

1. ALL KIND OF HANDLING DAMAGES TO CONTAINERS AND/OR CARGO.
2. WRONG DELIVERY OR MISDIRECTION OF CONTAINERS.
3. UNAVOIDABLE INTERFERENCE OF INTERNAL AND EXTERNAL TRAFFIC FLOWS.
4. NON-COMPLIANCE WITH IMO-CODE REGULATIONS.
5. INCIDENTS WITH CARGO OR OWN PROPERTY ON THE TERMINAL RESULTING IN CONSEQUENTIAL LOSS CLAIMS FROM THIRD PARTIES.

WHAT REDUCTION OR PREVENTION MEASURES HAVE BEEN TAKEN TO CONTROL THESE RISKS ?

1. ALL ACCIDENTS RESULTING IN DAMAGE TO CARGO AND/OR CONTAINERS HAVE TO BE REPORTED IMMEDIATELY TO RISK MANAGEMENT DEPARTMENT. IN HOUSE RISK MANAGEMENT INFORMATION SYSTEMS HAVE BEEN DEVELOPED TO ANALYZE THE COLLECTED INFORMATION. ANALYTIC REPORTS ON WEEKLY, MONTHLY AND QUARTERLY BASE ARE RETURNED TO TERMINAL MANAGEMENT AND STAFF.

THIS INFORMATION ALLOWS OPERATIONAL MANAGEMENT AND RISK MANAGEMENT SERVICES TO STUDY ANY TRENDS IN DAMAGES AND REPETITIVE ACCIDENTS OF THE SAME NATURE FOR WHICH EITHER PROCEDURAL OR TECHNICAL IMPROVEMENTS CAN BE REALIZED. THIS INFORMATION ALSO ALLOWS TO DETECT LACKS IN THE EXISTING TRAINING PROGRAM OR INTERMEDIATE NEEDS FOR RETRAINING.

2. WRONG DELIVERY AND MISDIRECTION :

- ALL EMPLOYEES RECEIVE A SPECIAL TRAINING ON THE TERMINAL OPERATIONS BEFORE THEY START THEIR SPECIFIC JOB;
- THE INFORMATION SYSTEM IS OF A VERY COMPLEX DESIGN BUT IS REALLY USER FRIENDLY. CONTROLS ON INPUT ARE AS BROAD AS POSSIBLE.

3. MIXING INTERNAL AND EXTERNAL TRAFFIC.

REMEMBER WHAT WE ALREADY TOLD IN THIS RESPECT UNDER THE HEADING PROTECTION OF THE PERSONNEL. ALL EXTERNAL TRAFFIC NECESSARY ON THE TERMINAL HAS TO PASS THE SECURITY SERVICES WHERE THEY GET THE ROAD MAP AND THE SPECIFIC INSTRUCTIONS IN RELATION TO THEIR TASK ON THE TERMINAL.

4. IMO-CODE REGULATIONS

HERE AGAIN WE REFER TO PREVIOUS REMARKS CONCERNING THE SPECIAL TRAINING FOR EMPLOYEES, THE IMO-MANUAL AND THE SAFETY OFFICER. CONTAINERS NOT COMPLYING WITH THE ADMINISTRATIVE REGULATIONS ARE SIMPLY NOT ACCEPTED AT THEIR ARRIVAL ON THE TERMINAL. IT IS A CUSTOMER'S RESPONSIBILITY TO COMPLY WITH THE IMO-CODE REGULATIONS. WE NEVER DO LABELLING ON OUR OWN RESPONSIBILITY.

5. CONSEQUENTIAL LOSS CLAIMS OR POLLUTION CLAIMS FROM THIRD PARTIES.

INCIDENTS LIKE THE SANDOZ POLLUTION OF THE RHINE SHOULD BE PREVENTED AT ALL TIMES. THEREFORE THE EXPORT PARKING ZONE WAS EQUIPPED WITH TWO ZONES OF 8,000 M^2 EACH WITH THEIR SEWAGE SEPARATED FROM THE GENERAL ONE. ALL IMO CONTAINERS ARE TO BE PARKED ON ONE OF BOTH AREAS. IN CASE OF ACCIDENTS OR LEAKAGE THE PRODUCTS ITSELF AND ALL THE EXTINGUISHING WATER CAN BE RETAINED

INSTEAD OF FLOWING INTO THE RIVER.

OTHER RISKS RELATED TO CONSEQUENTIAL LOSS SUCH AS BLOCKADE OF THE RIVER, THE LOCKS OR THE PUBLIC ROADS PASSING THROUGH THE TERMINAL AREA HAVE BEEN INVESTIGATED BUT CONSIDERED NOT RELEVANT. IN NO WAY THEY WILL INTERFERE WITH THE TRAFFIC IN THE LOCKS, RIVER, ETC.

THE STEAM CLEANING AREA HAS BEEN PROVIDED WITH A SIMILAR INSTALLATION : POLLUTED CLEANING WATER IS COLLECTED AND CAN BE TRANSFERRED TO THE OWNED BIOLOGICAL TREATMENT UNIT.

I WILL NOW PASS YOU BACK TO MR. W. AERNOUDTS, MODERATOR OF THIS PRESENTATION.