

Safety & Security in Critical Infrastructures & Ports as Opportunities for Plant Engineering



Genova , October 7th 2019

Safety & Security in Critical Infrastructures & Ports as Opportunities for Plant Engineering

1910



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M/V “IDEAL X” April 1956



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2012



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IN THE FIRST YEARS OF **2000** THE AVERAGE FLOW OF PORTACONTAINERS SHIPS WAS ABOUT

3,000 TEU

- AROUND **2007** THE AVERAGE FLOW WAS OF

5,500 TEU

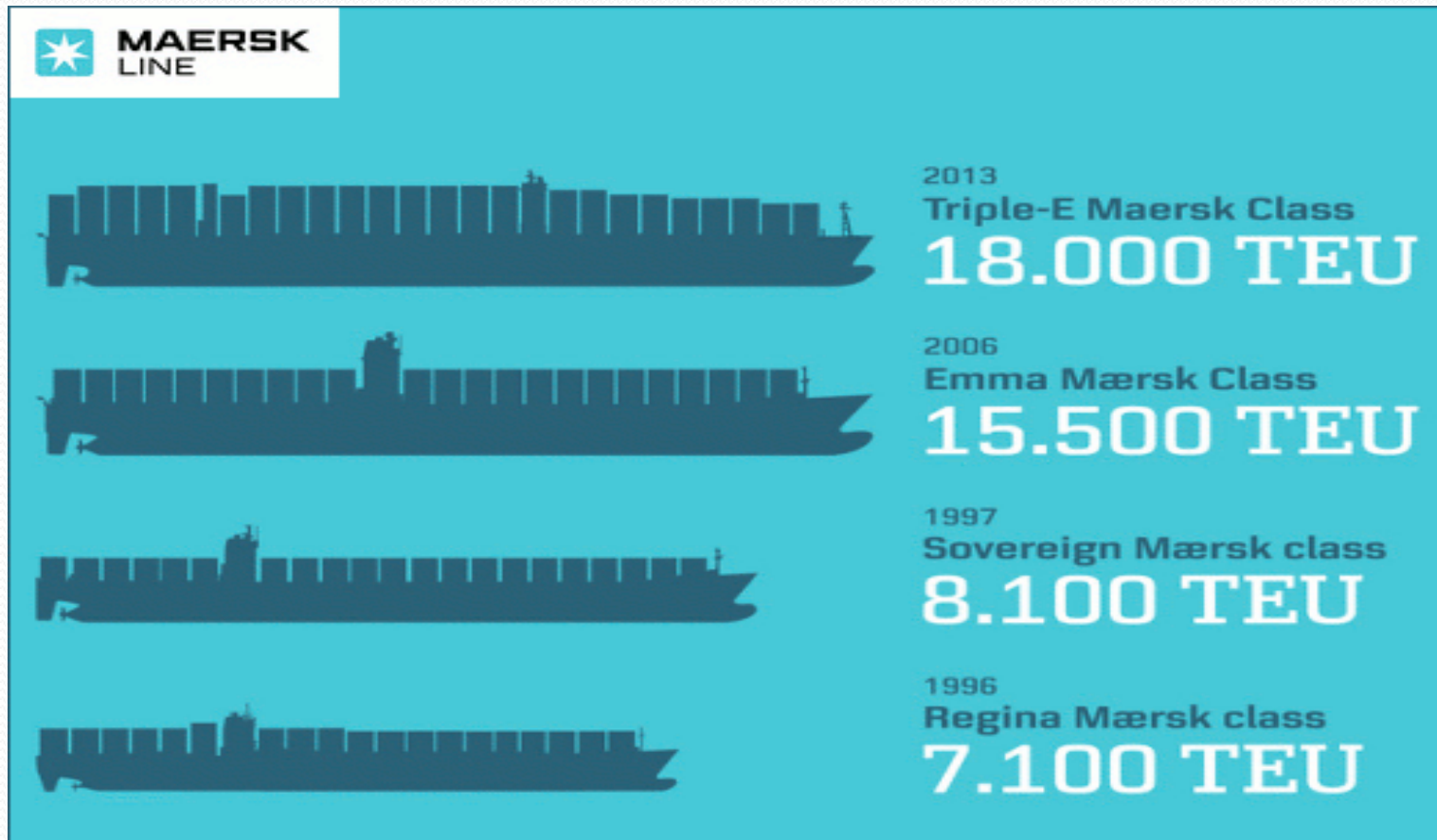
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IN THE FIRST YEARS **2012** THE AVERAGE FLOW
INCREASED UP TO **9,500 TEU**

THE PRESENT AVERAGE FLOW IS ABOUT **11.000**
TEU AND IS CONTINUOUSLY INCREASING

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- IN LESS THAN **20 YEARS** THE CONTAINERS' SHIPS CAPACITY AS DEPLOYED ABOUT **3 TIMES**



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Genova 2001



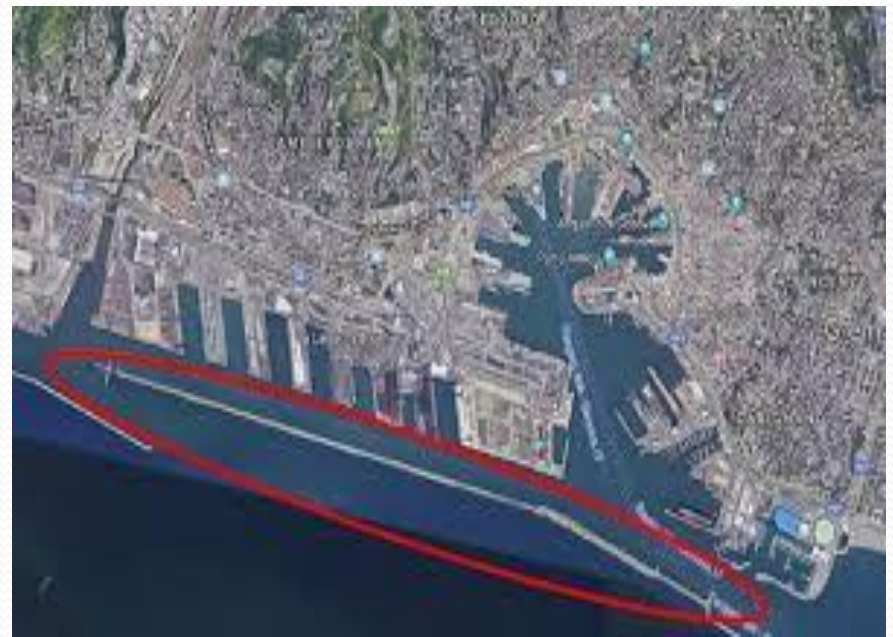
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Genova 2012



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THE ADVENT OF NAVAL GIGANTISM OVER 20 YEARS HAS SENSITIVELY MODIFIED THE TERMINAL'S OPERATIONAL ORGANIZATION AND THE PORT'S INFRASTRUCTURES



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NEEDING OF NEW EQUIPMENTS SUITABLE FOR THE NEW DIMENSIONS OF SHIPS



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NEW EQUIPMENTS OF IT SYSTEMS TO MANAGE THE INCREASED VOLUME OF BUSINESS

NEW LABOUR ORGANIZATION AND NEW PLANNING OPERATIONS



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- NEW ENVIRONMENTAL ASPECTS AS WELL



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TIMES ARE CHANGING AND THE INDUSTRY HAVE TO BE PROMPT TO FACE NEW **RISKS** – THREATS - AND NEW **OPPORTUNITIES**



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Starting from 2010 the company has activated a crane modification program – REVAMPING - so as to be able to operate ships with capacity up to 14,000 TEU, thanks to the increase in the outreach to 48 m and the height under the spreader up to 38 mt.



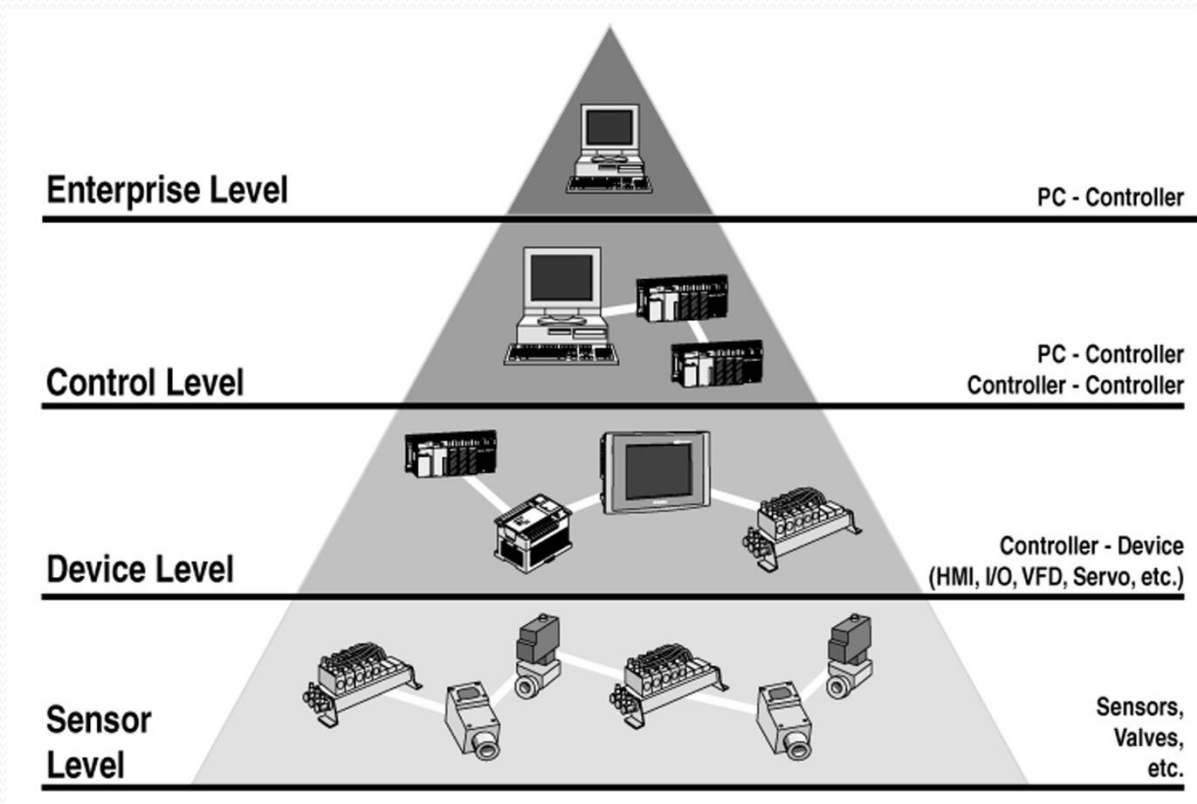
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The intervention lasted about 15 months during which the cranes were removed from their site and modified one at a time so as to always have four cranes available. The total cost of the operations was around 40% of the total revenue. !



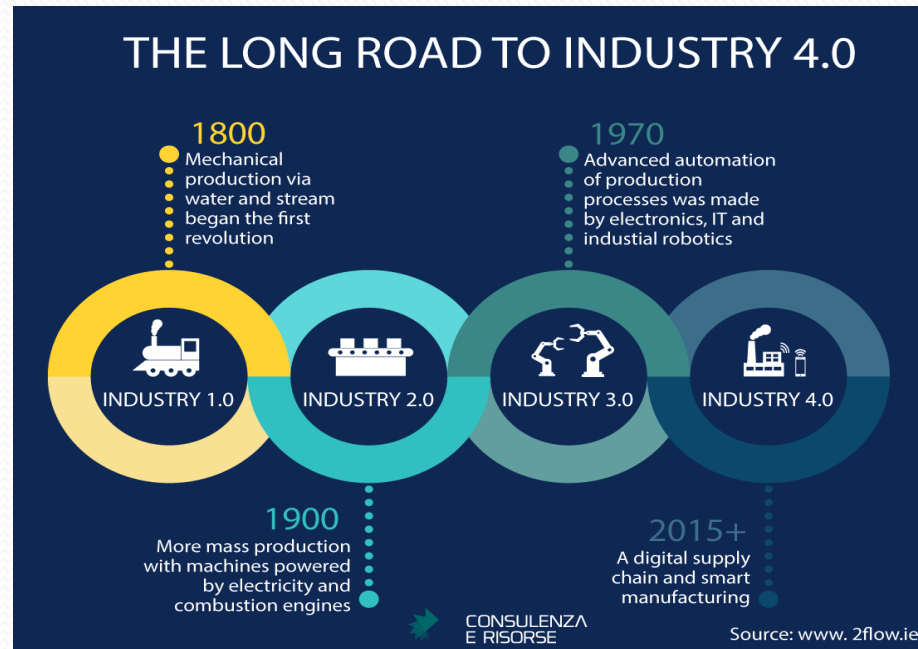
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Modifications were introduced on the operating logics and were increased the process automation.



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Presently the “**I PER AMMORTAMENTO**” is a facility aimed to encourage investments in instrumental assets purchased to transform the company into a technological and **digital** 4.0 key.



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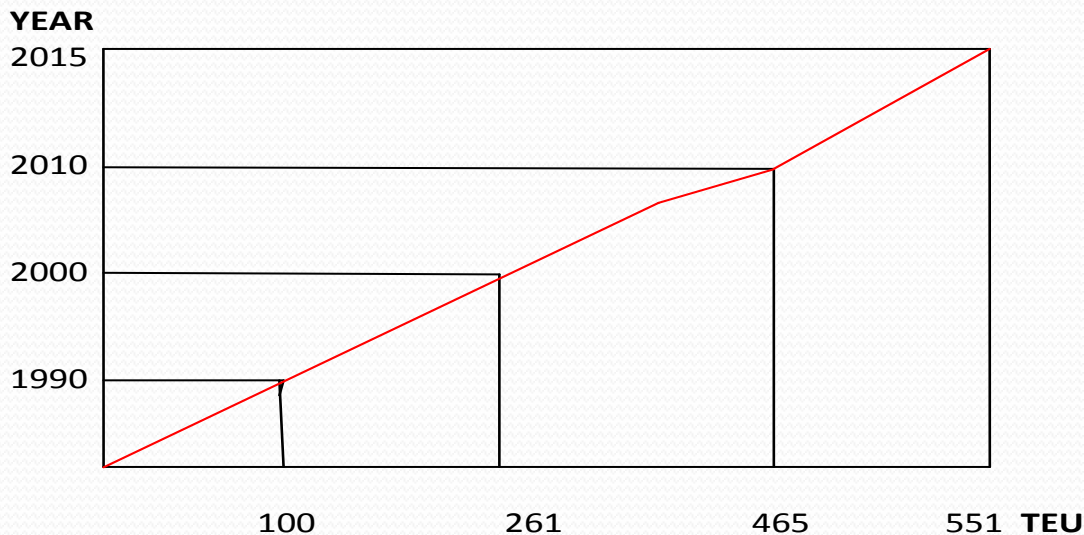
NEW SOFTWARES HAVE BEEN ADOPTED TO HAVE IN A INNER CLOUD ALL THE EQUIPMENTS CONTROL DURING THEIR WORKING OPERATIONS (**CONTROL ROM**)



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THE MANAGEMENT OF THE DANGEROUS CARGO HAS CHANGED AND INCREASED DURING THE TIME

TERMINAL CAPACITY DANGEROUS GOODS



IN 15 YEARS INCREASED 5 TIMES

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DUE TO THE CONTINUOUS INCREASING OF THE VOLUME OF THE IMO CONTAINERS TO BE HANDLED IT BECAME NECESSARY TO APPLY COMPUTERIZED TOOLS ALLOWING TO MANAGE ADEQUATELY THE NEW VOLUMES OF DATA BY REMOVING IN PRINCIPLE THE PAPER MANAGEMENT OF THE SAFETY DATA SHEET



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FOR THE HANDLING OF DANGEROUS GOODS A FUNDAMENTAL ASPECT IS TO HAVE THE SAFETY DATA SHEET TO IN ORDER OBTAIN ALL THE INFORMATIONS NEEDED FOR A RISK ASSESSMENT AND FOR THE MANAGEMENT OF ANY EMERGENCIES FOLLOWED BY AN ACCIDENTS



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IN THE PRESENCE OF LARGE QUANTITIES OF GOODS IT IS IMPOSSIBLE TO BE ABLE TO FIND PAPER INFORMATION. A **DIGITAL ARCHIVE** THEREFORE BECOME UNAVOIDABLE AND **VITAL TO USE** OR EVEN BETTER A **MANAGEMENT SOFTWARE** FROM WHICH YOU CAN OBTAIN ALL THE INFORMATION NEEDED



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A CONCRETE EXAMPLE OF THE VALIDITY OF AN IT SYSTEM IN SUPPORT OF THE SAFETY AND SECURITY MANAGEMENT CONNECTED TO THE DANGEROUS GOODS HAS BEEN EXPERIENCED ON

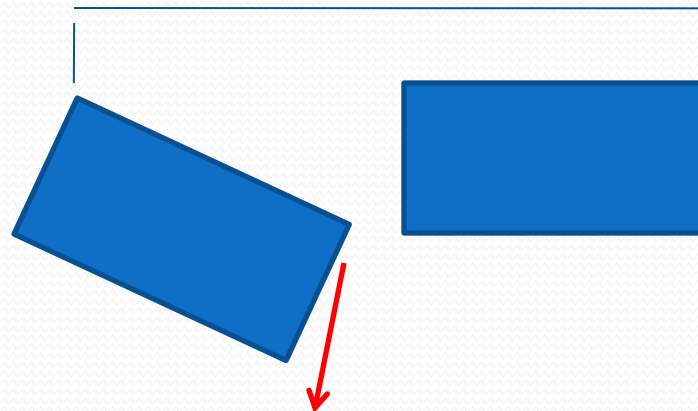
11 SEPTEMBER 2010

FOLLOWING BY AN **NBCR EMERGENCY** OCCURRED ON BOARD OF A SHIP MOORED AT THE TERMINAL.

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A CRANE DRIVER RAISED TWO 20' CONTAINERS AT THE SAME TIME WITH THE SPREADER IN THE 40' POSITION

DURING THE LIFTING ONE OF THE TWO CONTAINERS DROPPED DOWN FROM ABT 8 METERS OVER THE UNDERLYING CONTAINERS



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THE CONTAINER FALLED CONTAINED LAUROYL CHLORIDE DRUMS - IMO CLASS 8
WHILE THE ANOTHER CONTAINER INVOLVED WAS CONTAINING ORTHOCHLOROBENZALDEHYDE IMO CLASS 8



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**BOTH SUBSTANCES REACTED DUE TO THE PRESENCE OF WATER / HUMIDITY
RELEASING CHLORIDRIC ACID**



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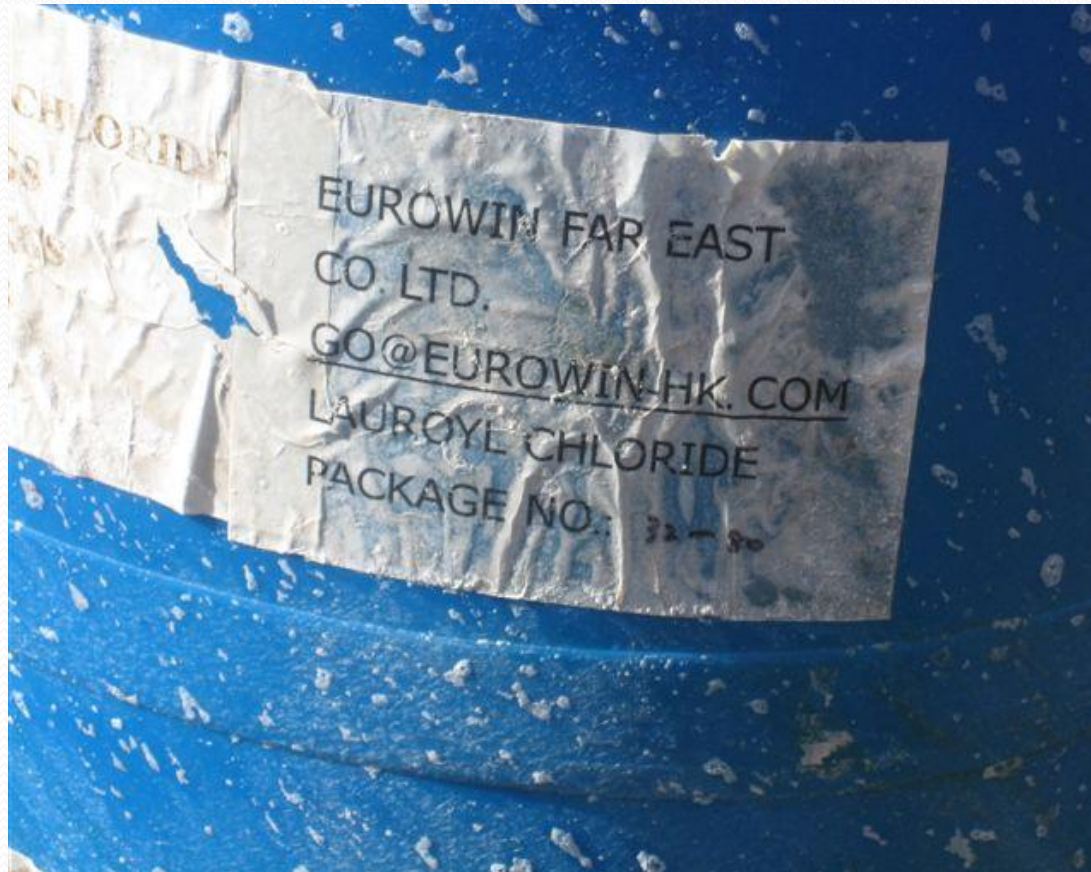
Moreover by means of the software analysis both substances were resulting to be present in the security chapter 1.4 of the **IMDG/ISP Code** as sensitive substances for security accidents thus increasing the general attention's level in the terminal by the **AUTHORITIES**



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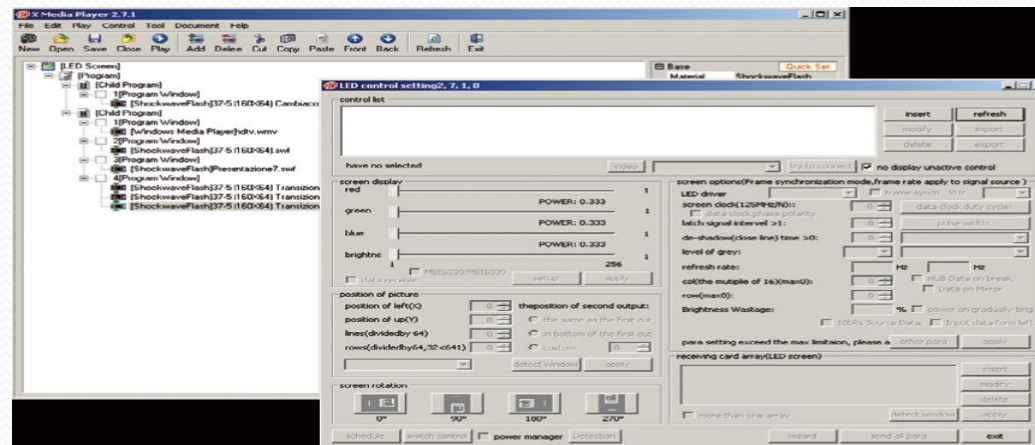


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OUR OFFICE WAS CALLED PROMPTLY AND COULD VERIFY THROUGH THE DEDICATED SOFTWARE THE TYPE AND THE LEVEL OF DANGER OF THE SUBSTANCES INVOLVED AND THEREFORE PROVIDED THE PROMPT EVACUATION OF THE WHOLE PERSONNEL FROM THE SHIP AND THE QUAY



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THE SAFETY INFORMATIONS OBTAINED FROM THE SOFTWARE WERE REFERRED IMMEDIATELY TO THE FIRE BRIGADE AND TO THE PORT CHEMIST AT THEIR ARRIVAL TO BE ABLE SO TO SETTLE THE FIRST INTERVENTIONS REQUIRED WITHOUT LOSS OF TIME IN THE NEED TO UNDERSTAND WHICH WERE THE INTERESTED SUBSTANCES WHICH WAS THE DANGER LEVEL AND THE FOLLOWING MEASURES TO BE ADOPTED

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**WHEN WE ARE TALKING ABOUT EMERGENCIES
THE IMPORT MATTER IS THE RESPONSE TIME**



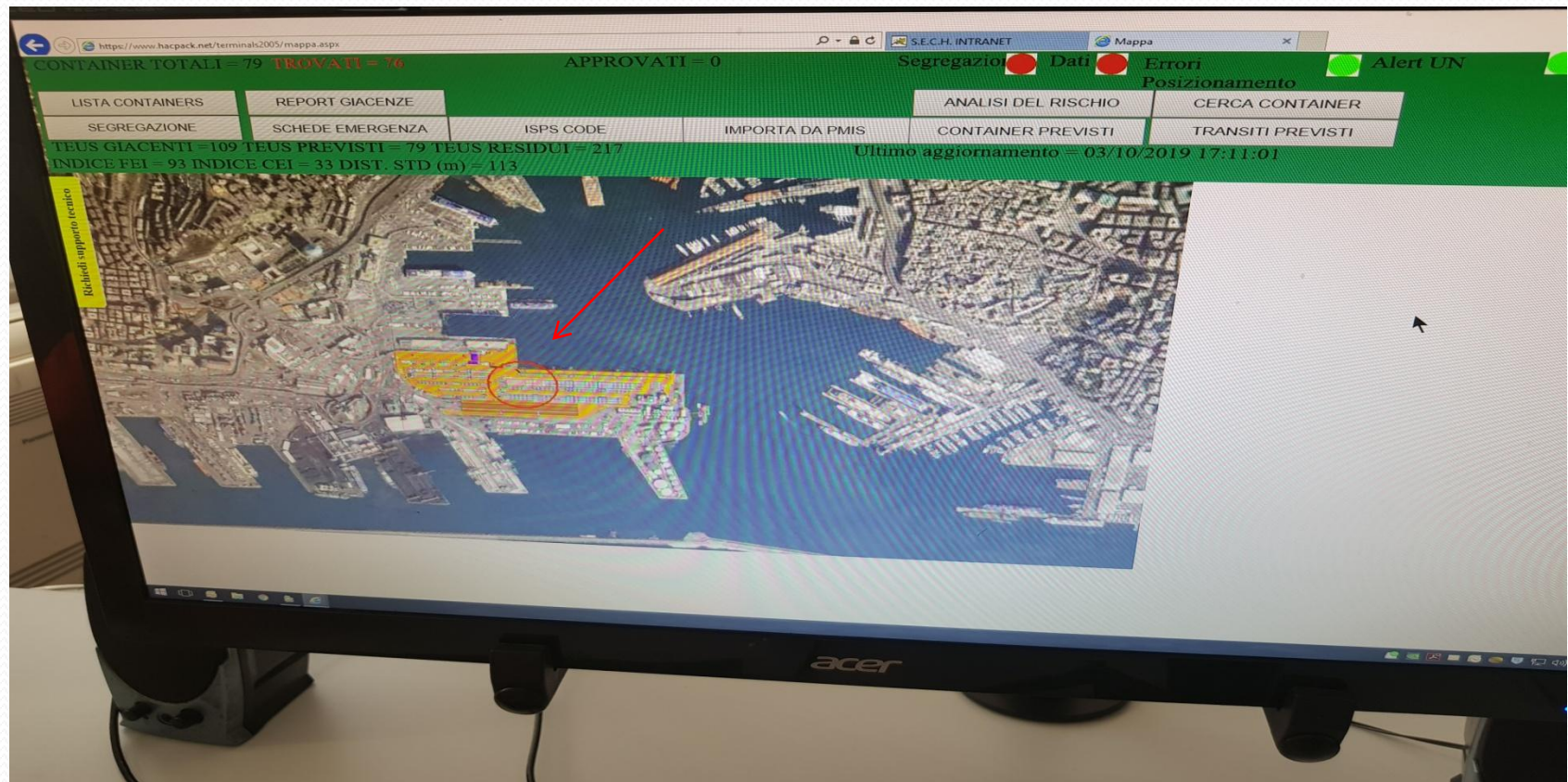
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30 PEOPLE WERE EVACUATED FROM THE VESSEL AND ALL THEM PROPERLY AND IMMEDIATELY TREATED



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A **HOT AREA** WAS DEFINED BY THE DEDICATED SOFTWARE WITH ALLOWED ACCESS TO PERSONNEL PROVIDED BY THE PROPER PPE ONLY



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THE SAFETY INSTRUCTIONS TO WORKERS AND THEN TO THE EMERGENCY PERSONNEL INTERVENED WERE IMMEDIATELY OBTAINED BY THE SDS PRESENT IN THE DEDICATED SOFTWARE

The image shows a computer monitor displaying a Safety Data Sheet (SDS) for METIL PROPIL CHETONE. The document is titled "MISURE DI SICUREZZA E PRONTO INTERVENTO" and includes the following information:

- Product Name:** METIL PROPIL CHETONE
- Chemical Formula:** $C_8H_{16}O$ / $CH_3(CH_2)_2COCH_3$
- UN 1249** (Hazard Class)
- CAS:** 107-87-9
- CLASSE 3** (Hazard Class)
- SINONIMI:** 2-Pentanone, etil acetone, MPK
- LIMITE DI ESPOSIZIONE:** TLV: 200 ppm; 705 mg/m³ (come TWA); 250 ppm; 881 mg/m³ (come STEL) (ACGIH 1997).
- ASPETTO:** LIQUIDO INCOLORE, CON ODORE CARATTERISTICO
- DATI CHIMICO-FISICI:**
 - Massa molecolare: 96,1
 - Punto di ebollizione: 102°C
 - Punto di fusione: -78°C
 - Densità relativa (acqua=1): 0,807 g/cm³
 - Sciubilità in acqua, a 20°C: 4 (moderata)
 - Costante di vapore: 0,22 a 22°C; 1,5
 - Densità di vapore relativa (aria=1): 3,0 g/L
 - Densità relativa della miscela aria/vapore a 20°C (aria=1): 1,03
 - Punto di infiammabilità: 7°C c.c.
 - Temperatura di auto-accensione: 505°C
 - Limiti di esplosività, vol % in aria: 1,5-8,2
 - Coefficiente di ripartizione ottanolo/acqua come log Pow: 0,91
- PERICOLI CHIMICI E FISICI:** Reagisce violentemente con forti ossidanti, basi forti, ammine ed isocianati.
- INCOMPATIBILITÀ:** In contatto si miscela bene con aria, si formano facilmente miscele esplosive. Per movimento o agitazione possono produrre cariche elettrostatiche.
- AGENTI OSSIDANTI:** Agenti ossidanti, basi forti, agenti riducenti, ammine, isocianati.
- METODOLOGIA DI INTERVENTO IN CASO DI INCIDENTE:** Controllare la valutazione dei rischi, prevedere la necessità di respiratori a ventilazione meccanica, utilizzare una maschera a pieno facciale con filtri combinati di tipo ABEK come supporto alle misure tecniche, se il respiratore costituisce l'unico mezzo di protezione, utilizzare un sistema ventilato a pieno facciale.
- INFORMAZIONI ADDIZIONALI SULL'USO DI RESPIRATORI IN CASO DI RILASCIO ACCIDENTALE:** Controllare la valutazione dei rischi, prevedere la necessità di respiratori a ventilazione meccanica, utilizzare una maschera a pieno facciale con filtri combinati di tipo ABEK come supporto alle misure tecniche, se il respiratore costituisce l'unico mezzo di protezione, utilizzare un sistema ventilato a pieno facciale.

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NO ONE REMAINED INJURED APART 1 WORKER
THE NEAREST TO THE ACCIDENT AREA (5 DAYS)

THE INJURY WAS CONTAINED BY THE **PROMPT**
RADIO COMMUNICATION WITH THE **HSSE**
OFFICE PROVIDING THE **CORRECT SAFETY**
INFORMATION TO THE WORKERS TO LEAVE
IMMEDIATELY THE AREA

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THE EMERGENCY AND THE RECOVERING ACTIONS TOOK A LONG TIME WITH HUNDREDS OF PEOPLE INVOLVED



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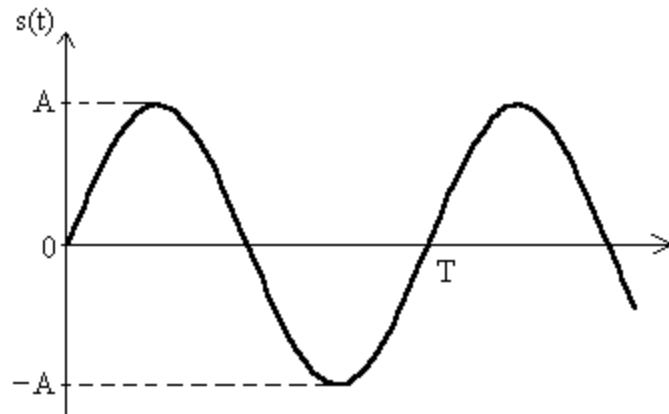
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FROM THIS EXPERIENCE IT IS HAS BEEN ACCLARED THE NEEDING TO **GET COPY OF THE SAFETY DATA SHEET IMMEDIATELY** AND TO HAVE A DEDICATED **SOFTWARE** TO MAKE AN ANALYS ON **FEI AND CEI RISKS** ON THE DANGEROUS GOOS PRESENT IN THE TERMINAL AND TO **DETERMINE THE HOT AREA** IN CASE OF EMERGENCY IN ORDER TO EVACAUTE AS SOON AS POSSIBLE ALL PEOPLE INVOLVED.

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IN A CONTAINER TERMINAL THE CURVE OF THE RISK CONNECTED TO THE DANGEROUS GOODS IS SINUSOIDAL COSTANTLY CHANGING TIME BY TIME DEPENDING BY THE QUANTITY AND QUALITY OF THE PRODUCT PRESENT IN THE TERMINAL .

LOADING – DISCHARGE CONTINUOUSLY



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CONSIDERING THE NOT SO RECENT CHANGES IN THE MARITIME TRANSPORT BECAMES MORE AND MORE NECESSARY THE ADOPTION OF A SOFTWARE TO EVALUATE THE COSTANT RISK'S VARIATIONS ABOUT THE DANGEROUS GOODS PRESENT IN A TERMINAL

PRESENTLY THE ITALIAN LAW IS VACANT ON THIS ASPECT AND THE EVALUATION OF THE RISK IS REFERRED TO DIFFERENT RULES ISSUED BY THE LOCAL AUTHORITIES

THUS CREATING A JEOPARDAZING SAFETY APPROACH TO THE SAME PROBLEM

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MANY RISKS AND OPPORTUNITIES ARE IN FRONT OF US

IT'S ONLY NECESSARY TO BE ORGANIZED



Thanks

Capt.F.Parodi