

PRESENTATION TO VCSA OCTOBER 1993



CTL015081

DEVELOPMENT OF MAJOR HAZARDS LEGISLATION

		UK	EC
FLIXBOROUGH (28)	1974		
	1975		
SEVESO	1976	1	
	1977		
SAN CARLOS (215)	1978		
	1979	2	ACMH
	1980		
	1981		
	1982		82/501
	1983		COUNCIL DIRECTIVES
MEXICO CITY (500?)		3	
BHOPAL (3000?)	1984		
	1985		
CHERNOBYL (?)			
BULGARIA PVC (17)	1986		
SANDOZ BASEL			
			87/216
HERBORN (5)	1987		
PIPER A (167)	1988		
			88/610
JONAVA (80?)			
EXXON VALDEZ	1989		
PHILLIPS TX (23)			
ARCO TX (17)			
BANGKOK LPG (63)	1990		

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Official Journal of the European Communities

COUNCIL DIRECTIVE

of 24 June 1982

on the major-accident hazards of certain industrial activities

(82/501/EEC)

S T A T U T O R Y I N S T R U M E N T S

1984 No. 1902

HEALTH AND SAFETY

**The Control of Industrial Major Accident Hazards Regulations
1984**

**STATUTE BOOK OF THE SWEDISH
NATIONAL BOARD OF OCCUPATIONAL
SAFETY AND HEALTH**

Ordinance (AFS 1989:6) concerning

LARGE-SCALE HANDLING OF CHEMICALS

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Article 3

... the manufacturer is obliged to take *all the measures necessary* to prevent major accidents and to limit their consequences for man and the environment.

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Article 4

... all manufacturers are required to *prove* to the competent authority *at any time* ... that they have identified existing major accident hazards, adopted the appropriate safety measures, and provided the persons working on the site with information, training and equipment in order to *ensure* their safety.

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HYDRO POLYMERS LIMITED SEVESO DIRECTIVE TOP-TIER SITES

Article 5

***SAFETY CASE* containing -**

(a) information on dangerous substances

(c) information on

(b) information on

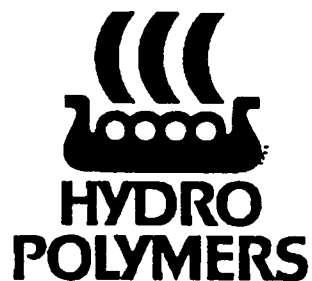
- installations and processes**
- meteorological conditions**
- people on site and exposed**
- management systems**
- hazard sources**
- potential accident causes**
- control systems and preventive measures**

**- onsite emergency equipment, response
and plans**

**- the name of the person responsible
for safety**

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SAFETY CASE

as required by the

CONTROL OF INDUSTRIAL MAJOR ACCIDENT HAZARDS REGULATIONS 1984

REVIEW ISSUE : JULY 1992

HYDRO POLYMERS LIMITED - SAFETY CASE

C O N T E N T S

SECTION

1. DEFINITIONS AND ABBREVIATIONS
2. INTRODUCTION
 - 2.1 Preamble
 - 2.2 Review Notes
3. MATERIAL HAZARDS
 - 3.1 Vinyl Chloride
 - 3.2 Analytical Methods for VCM
 - 3.2.1 In-Process and Finished Product Analysis
 - 3.2.2 Safety and Environmental Monitoring
 - 3.3 Hazards of Vinyl Chloride
 - 3.3.1 Acute Toxicity
 - 3.3.2 Chronic Toxicity
 - 3.3.3 Flammability
 - 3.3.4 Other Personnel Hazards
 - 3.3.5 Environmental Hazards
 - 3.4 Purity of VCM
 - 3.5 Other Materials
 - 3.5.1 Dangerous Substances
 - 3.5.2 Hazardous Materials
4. THE INSTALLATIONS
 - 4.1 The Environs of Hydro Polymers Limited
 - 4.2 Aycliffe Site Plan
 - 4.3 The Vinyl Chloride Polymerisation Process
 - 4.4 Personnel at Aycliffe Site
 - 4.5 Land Use Local to Hydro Polymers

5. MANAGEMENT SYSTEMS

- 5.1 Management Structure and Arrangements
- 5.2 Management Procedures for Safety
- 5.3 Engineering and Operational Safety Standards
 - 5.3.1 Design & Construction
 - 5.3.2 Inspection & Testing
 - 5.3.3 Operation & Maintenance
 - 5.3.4 Plant Audits
- 5.4 Training

6. POTENTIAL FOR MAJOR ACCIDENTS

- 6.1 Hazard and Risk Assessment Methodology
 - 6.1.1 Hazard Ranking
 - 6.1.2 Evaporation and Gas Dispersion
 - 6.1.3 Atmospheric Effects
 - 6.1.4 Fires
 - 6.1.5 Vapour Cloud Explosion
 - 6.1.6 Failure Rates and Fault Trees
 - 6.1.7 Ignition Modelling
- 6.2 Sources of Major Accidents and Hazard Ranges
 - 6.2.1 Potential Accident Sources
 - 6.2.2 Potential Accident Causes and Assessment
 - 6.2.3 Accident Consequence Scenarios
 - 6.2.4 Major Environmental Accidents
 - 6.2.5 Maximum Hazard Ranges
- 6.3 Prevention and Limitation of Accidents
 - 6.3.1 Measures for Accident Prevention
 - 6.3.2 Limitation of Accidental Damage and Consequences
- 6.4 Probabilities and Consequences of Major Accidents
 - 6.4.1 Runaway Reaction
 - 6.4.2 Failure of C Plant VCM Sphere, TK-2B
 - 6.4.3 Overview of Major VCM Release Potential
 - 6.4.4 Uncertainty in Hazard Assessment
 - 6.4.5 Conclusions on Risk
- 6.5 Emergency Procedures and Planning
- 6.6 Meteorological Conditions
- 6.7 Personnel Particularly Exposed to Hazards

7. PROGRESS AND FUTURE PLANS

8. REFERENCES

9. PROCESS DRAWINGS

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Article 7

Offsite Emergency Plan

Article 8

Information to the Public

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NORSK HYDRO CORPORATE PROCEDURES

TITLE : PROCESS SAFETY

OBJECTIVE : All hazards which may give rise to process related accidents shall be identified, understood and controlled.

APPLICATION : All operations which involve the manufacture, processing, storing or internal transportation of materials representing a risk to life, environment and property.

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PROCESS SAFETY MANAGEMENT SYSTEM

- **Process safety information**
 - **Process safety studies** [HRA]
 - **hazard ranking and assessment**
 - **risk acceptance criteria**
 - **Operating Procedures** [CTS-11]
 - **Safe work practices** [CTS-04]
 - **Modifications to process variables and equipment** [CTS-01]
 - **Quality control and maintenance of equipment** [CTS-03]
 - **Competence and training** [CTS-12]
 - **Investigation & reporting of incidents & accidents** [CTS-02]
 - **Emergency planning and response** [CTS-10]
 - **Pre-startup safety reviews**
 - **Inspections and auditing**
-



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PROCESS SAFETY AUDITS

- 1. Systems Audit**
- 2. Compliance Audit**

Detailed check lists for carrying out the Audit.

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1

HYDRO POLYMERS LTD AUDIT CHECK LIST Modifications to Process Variables & Equipment

Modification Procedure Available?

2

Is responsible person for decision clearly stated?

3

**Are normal/acceptable operating bands
defined for plant & process conditions?**

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4

HYDRO POLYMERS LTD AUDIT CHECK LIST Modifications to Process Variables & Equipment

**Are upper and lower safe limits defined for
plant & process conditions?**

5

**Who authorises deviation/experimentation
outside normal process condition range?**

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6

HYDRO POLYMERS LTD AUDIT CHECK LIST Modifications to Process Variables & Equipment

Are there safety reviews prior to changes, e.g. covering

- new materials?**
- corrosion effects?**
- equipment design limitations?**

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HYDRO POLYMERS LTD AUDIT CHECK LIST Modifications to Process Variables & Equipment

**Are special startup & operating
instructions provided?**

8

Are there required Hazop-analyses or similar?

9

Are all changes traceable and documented?

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10

HYDRO POLYMERS LTD AUDIT CHECK LIST Modifications to Process Variables & Equipment

**Does change of trip setting require use of
modification procedure?**

11

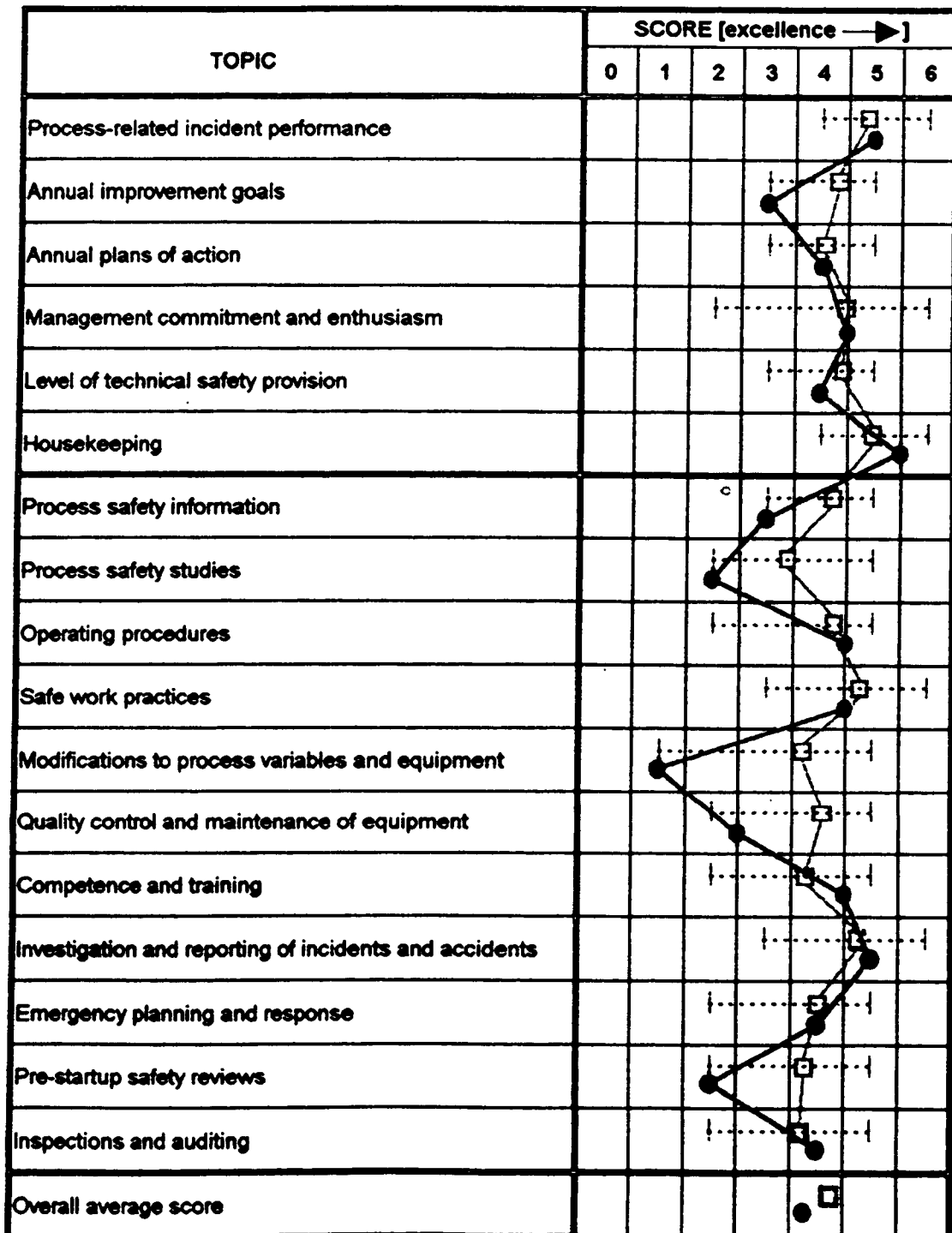
**Do changes require change of P&ID and
other documentation?**

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PROCESS SAFETY PROFILE

key: ● Audit Team Scores
 {.....□.....} SPC Score Range & Mean



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