

Within the Context of Seveso II, Importance of Risk-Based Inspection in Oil, Gas and Petrochemical Industry



Özlem ÖZKILIÇ
M.Sc., Chemical Engineer
Ministry of Labor and Social Security
Labor Inspector

FILXBOROUGH, 01.06.1974,
UK



Industrial Disaster and Accidents

- Human beings have been experiencing natural disasters before the industrial revolution and **industrial accidents** started after the industrial revolution.
- The biggest impact as a result of industrial accidents, disasters are mostly caused by the **chemical industry and industries using chemicals.**



**Major Industrial Accidents
Causing the Development of the
Seveso II Directive**

Industrial Disaster

Between 1959 and 1996, **several major industrial accidents have occurred around the world** and the need for legal sanctions to prevent these accidents was born.



Development of the Seveso II Directive

After experiencing accidents

➤ **Seveso I Directive (82/501/EEC)** was adopted focusing on Industrial Accident Prevention Equipment.



**Flixborough
(United Kingdom)
June, 1974**

**Beek (Netherlands)
November, 1975**

**Seveso (Italy)
July, 1976**

Development of the Seveso II Directive



**82/501/EEC
(Seveso I)**

Because industrial accidents continue....

➤ Seveso I Directive has been revised and Seveso II Directive No. 82/501/EEC was adopted in 1996.



**Flixborough
(United Kingdom)
June, 1974**

**Beek
(Netherlands)
November, 1975**

**Seveso
(Italy)
July, 1976**

**Mexico City
(Mexico)
November, 1984**

**Bhopal (India)
December, 1984**

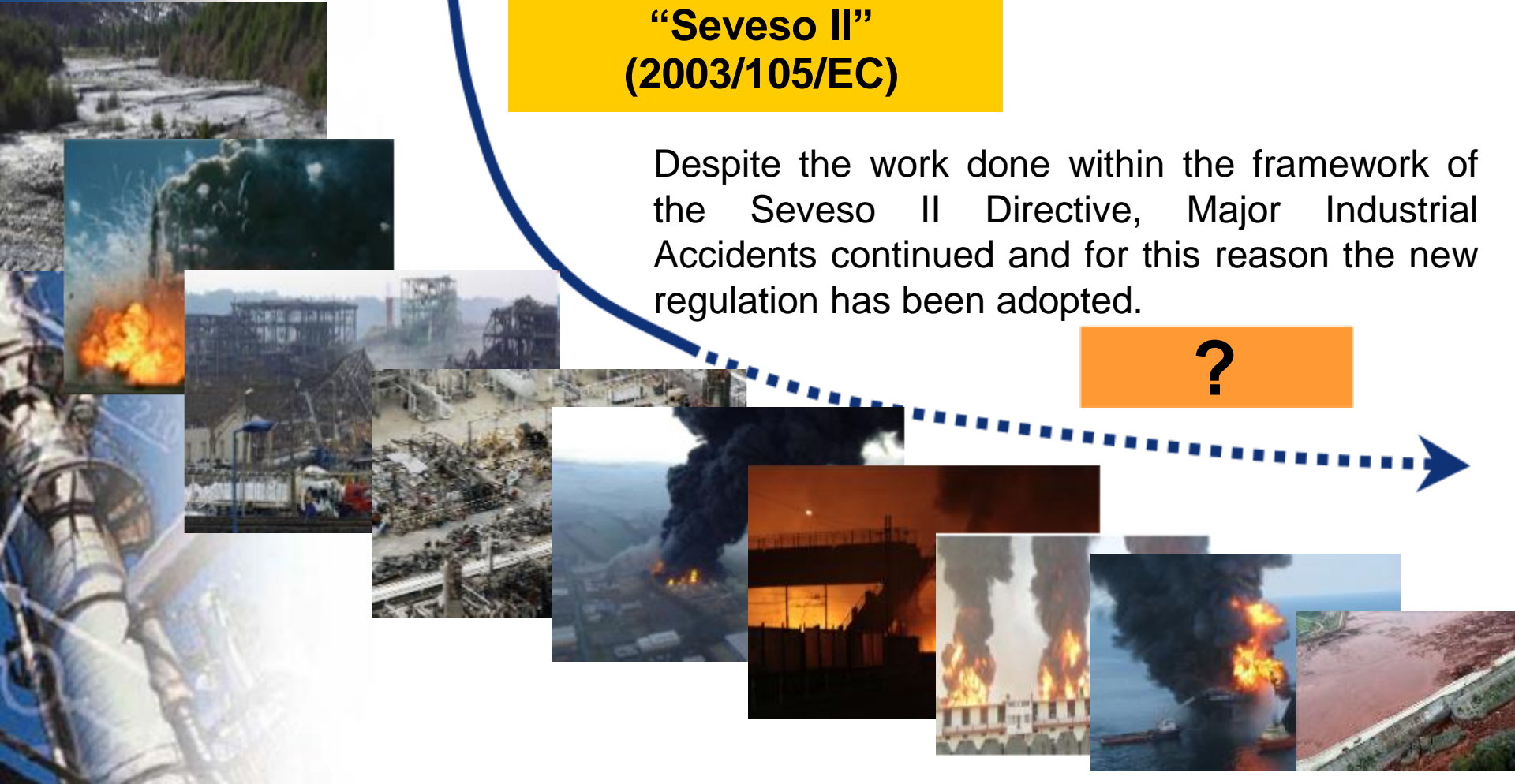
**Basel
(Switzerland)
November, 1986**

Development of the Seveso II Directive

“Seveso II” (2003/105/EC)

Despite the work done within the framework of the Seveso II Directive, Major Industrial Accidents continued and for this reason the new regulation has been adopted.

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Baia Mare (Romania)	Enschede (Netherlands)	Toulouse (France)	Texas City (America)	Buncefield (United Kingdom)	Viareggio (Italy)	Jaipur (India)	North Atlantic Ocean	Budapeşte (Hungary)
June, 2000	May, 2000	September, 2001	March, 2005	December, 2005	June, 2009	October, 2009	April, 2010	October, 2010

A large-scale industrial fire is shown, with a massive plume of orange and yellow flames rising from a complex of metal structures, including a tall tower. In the foreground, a red fire truck is visible, and a firefighter in full gear is positioned near the truck, facing the fire. The scene is set outdoors, with some greenery and a blue sign visible in the background.

**Examples of Major Industrial
Accidents Occurred in Our Country**

**Tüpraş İzmit Refinery
17 August 1999**

200 million US\$ damage



Mersin ATAŞ Refinery
25 Temmuz 2004



**Kocaeli AKÇAGAZ LPG Filling
Facility
28 Temmuz 2002**





Harmonization the Seveso II Directive in Turkey

- Studies regarding the harmonization with Seveso II Directives completed on 2010. The Regulation on the Control of Major Industrial Accidents was published in the Official Gazette dated August 18, 2010 and No. 27676

The background image shows an industrial plant. On the left, there is a tall, cylindrical structure with a platform and ladders. To the right, a thick plume of dark smoke or steam rises into the sky. The foreground is filled with a complex network of pipes, valves, and structural steel. A large, white cylindrical tank with a yellow band is visible on the left side of the foreground. The overall scene is a typical industrial setting.

**Relationship between Seveso II
Directive and
Risk-Based Inspection**



Seveso II Directive

Major Accident Prevention Policy

- Seveso Directive requires the preparation of a Major Accident Prevention Policy.
- This policy should demonstrate that all the necessary measures have been taken to prevent major accidents and limit their consequences to persons and the environment.

Seveso II Directive

Risk and Risk Control

- It recognizes that risk cannot always be completely eliminated, but there is an inversely proportional relationship between the risk and the measures taken to control the risk.



Seveso II Directive

Continuing Integrity of Equipment

- Preventing the loss of containment system of hazardous substances is often key to avoid major accidents.



Seveso II Directive

Continuing Integrity of Equipment

- A suitable scheme of in-service examination can therefore be an important part of the necessary measures to avoid major accidents, **but is not an explicit requirement of the Seveso regulations.**



Seveso II Directive Continuing Integrity of Equipment

➤ The Oil, Gas and Petrochemical Industry is facing tough challenges regarding risk mitigation to improve safety and reliability on the one hand cost pressure about the risk mitigation measures on the other hand.



Seveso II Directive

Continuing Integrity of Equipment



- However, in most cases the highest risk is mostly associated with a small percentage of plant items.

- These potential high-risk components require a greater degree of attention than others.





What is Risk-Based Inspection Why It is Necessary?



What is Risk-Based Inspection

Why It is Necessary?



- The Control of Major Accident Hazards Regulations (COMAH or Seveso II) cover the control of major accident hazards at installations as a whole.

- Such installations may include atmospheric storage tanks, process pipework and other equipment containing flammable or toxic and other hazardous materials.



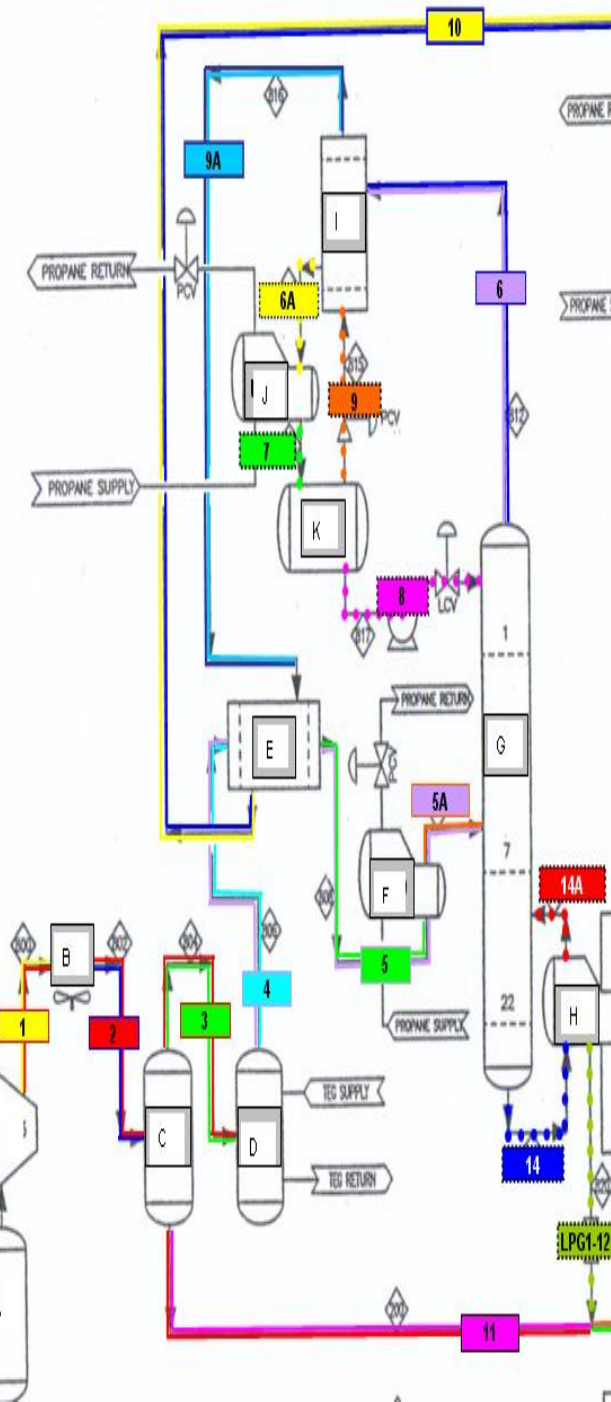
Risk-Based Inspection

Why It is Necessary?

- Many refining and petrochemical plants struggle with a mountain of process safety and engineering information.



- RBI is accepted as good engineering practice for the implementation of inspection and maintenance programs and has its roots in **Process Safety Management** and **Mechanical Integrity** programs.



Risk-Based Inspection

Why It is Necessary?

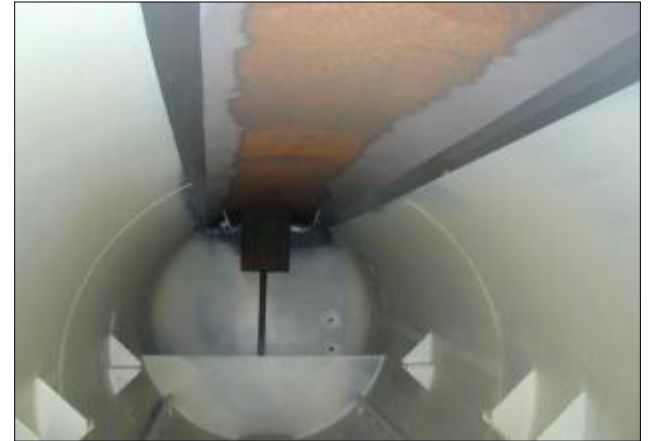
- Risk-Based Inspection is a process that identifies, assesses and maps industrial risks (due to corrosion and stress cracking), which can compromise equipment integrity in both pressurized equipment and structural elements.



Risk-Based Inspection

Why It is Necessary?

- The ultimate goal of RBI is to develop a cost-effective inspection and maintenance program that provides assurance of acceptable **mechanical integrity** and **reliability**.





CONCLUSION

- In-service inspection is a backstop to prevent failure when a root cause has led to deterioration from the design intent or the as manufactured condition.
- Although RBI is quite a new concept and not known very well in our country, for the reasons outlined previously, it should be paid attention and its widely acceptance should be promoted.

A low-angle photograph of a space shuttle launch. The shuttle is on the left, ascending vertically against a clear blue sky. A large plume of white smoke and steam trails behind it. The shuttle's external tank and boosters are visible, with some technical markings like 'C-210' and '11' on the boosters. The overall scene is bright and dynamic, capturing the power of the launch.

**Thank You
For Your Attention!**