



Integrated Approach Proposal for Evaluation of both Environmental and Accidental Risks in Industrial Management

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Environmental impacts by both man-made interventions and accidental events are taking on considerable importance; and developing the capacity to minimize these impacts and their harmful consequences for ecosystems and human health is a daunting task for environmental legislators and regulators.

A major challenge in impact and risk assessment, as part of safety and integrated environmental management, is to link harmful effects of pollution (including toxic chemicals) to natural resources (soil, underground water, etc..) and to human health. Complex issues are involved in evaluating both environmental risk, for the effects on the ecosystems, and accidental risk, derivative for use of complex mixtures potentially dangerous in productive industrial processes. Therefore, risk assessment and management must include tools based on externally generated risk contours and links to optimal management models of industrial plants by application of Best Available Techniques (BAT). In particular, to reduction models of, accidental and continuous, atmospheric releases and of spills into surface water systems. By the adoption, before of the Directive 82/501/CE (EC, 1982), then of the Directive 96/82/EC (EC, 1996), called Directive "Seveso II", were obtained two aims. The first is prevention of major accident hazards involving dangerous substances. The second is limitation of accidental consequences for man and for environment by introduction of concept of "Domino Effect". This directive has been implemented in Italy by the Legislative Decree no.334 of 17 August 1999 (IG, 1999), hereinafter "L.D. no. 334/99" or "Decree", then revised by the Legislative Decree no. 238 of 21 September 2005, "L.D. no. 238/05" (IG, 2005). Indeed, article no. 25 of Decree establishes that Regions carry out audits on safety management system (SMS) of industrial plants, classified as article no. 6 of L.D. no. 334/99, and the Environment Ministry carry out checks on plants classified as article no. 8, pending the full transfer of responsibilities from State to Regions in accordance by article no. 72 of Legislative Decree no. 112 of 31 March 1998, "L.D. no. 112/98" (IP, 1998) (Activities in Major Accident Risk). Therefore, preliminary investigation, control and planning aimed at ensuring ecosystems and human health security derived to use of hazardous substances, is a task for regional legislators. The Apulia has covered these issues by adopting of Regional Law no. 06 of 2008, "L. no. 06/08" (RC, 2008), as a prerequisite for proceeding to Agreement State-Region. On 21 December 2010, the European Commission has emanated the latest proposal for repeal and replace of current Directive to adopt by 1 June 2015. Therefore, European and national regulatory framework about accidental risks is defined and mature. In Italy, the control activities are carried out in line as in other EU countries.

This work presents the theoretical background of in force regulation, the concrete goals and most relevant findings got by operative experience derived of SMS analysis of industrial plants and necessary future developments.

1. Introduction: Normative References

The Industrial and Technological Risk regulation was launched by Community Directive 82/501/EEC (EC, 1982) known as the Directive Seveso I.

In Italy, the Seveso Directive was transposed by Presidential Decree no. 175 of 17 May 1988 (CMP, 1988) which distinguished between two industrial categories subject respectively to Notification and Declaration depending of hazardous substances amount held in establishments.

The L.D. no. 334/99 (IG, 1999), updated by L.D. no. 238/05 (IG, 2005) which transposed the EU Directive 96/82/EC - Seveso II (EC, 1996), divides into two categories that have a risk degree correlated at amount and specific dangerous substances used in industrial processes.

The Decree lays down obligations to which operators are subject (Notification and Safety Report, for article no. 8) and Notification (for article no. 6). The new classification REACH (Registration, Evaluation, Authorisation and Restriction of Chemical substances) could lead to new thresholds for industrial plant types subject to the "Seveso" (eg, dense fuels). In this context, the "Directive Proposal of the European Parliament and Council about control of major accident hazards involving dangerous substances", of 21 December 2010, aims at revising the European Directive 2003/105/EC (EC, 2003) in order to conform to Regulation REACH and, consequently, to Regulation CLP.

Prior to Constitution Title V reform, this law has expanded regional powers in according at article no. 18 of L.D. no. 334/99 (IG, 1999) and at article no. 72 of L.D. no. 112/98 (IP, 1998), stating that Regions operate "executive jurisdiction about major accidents". In this regulatory context, Apulia Region, by L. no. 06/08 (RC, 2008), has regulated technical issues of Planning and Emergency Management of Industrial Chemical Process Safety and environmental protection.

Article no. 20 par. 3 of L. no. 06/08 (RC, 2008), defines implementation of the entire regulation. It considers also technical appraisal, as provided by article no. 72 par. 3 of Legislative Decree no. 112 of 31 March 1998 (IP, 1998), limiting its own operability to the future stipulation "of a State-Region agreement program for condition verification for carrying out the functions".

Although L. no. 06/08 (RC, 2008), hasn't been implemented (in pending conclusion of State-Regions Agreement Program), the Council of Ministers Presidency have appealed it (article no. 2, par. 1, 2, letters c) d), and par. 3, letters h) i) j) of L. no. 06/08) but it was dismissed by ruling Constitutional Court which reaffirmed its constitutionality stating that "... assignment to Region of guidance and coordination function on major accident hazards involving dangerous substances not violates the state legislative power but rather it is application of same state law....".

Given the time elapsed from issue of L.D. no. 112/98 (IP, 1998) to now, it is hoped that State-Region Agreement Program should be quickly concluded. This uncertainty legal is reflected in investigations, inspections and administrative powers, even at local level. Pending the implementation of L. no. 06/08 (RC, 2008), the safety reports assessment is performed by competent authority represented by Fire Prevention Regional Technical Committee (CTR) of Presidency Decree no. 577 of 29 July 1982. It is integrated by representatives of Regional Environmental Protection Agency (ARPA), INAIL (ex ISPESL), Region, Province and Municipality local courts, as defined in article no. 19 of L.D. no. 334/99 (IG, 1999). In reference to installation safety, Decree provides for analysis of organizational and risk control tools and for adoption of SMS for implementing of accident preventing policy. The SMS structure was better outlined by "Guidelines for SMS Implementation" Decree of 9 August 2000 (EM, 2000). In general, the regional law action was aimed at reconciliation between responsible parties for carrying out of technical investigation, the responsible government bodies of territory and population without ignore the identification of appropriate checks and inspections to ensure the environmental respect and productive process protection in Apulia. In particular, such law is designed to regulate the administrative, technical and procedural performance of accident events by identifying of competent authorities, providing of specific Program Agreement.

It was paid particular attention to verify technical-management processes and systems, article no. 25 of Decree (control measures) (IG, 1999) or the implementation of SMS by the Manager.

2. Seveso Directive: Implementation status in state and regional field

Now, we analyse the current situation about function transfer from State to Regions (pursuant to article no. 72 par. 3 of L.D. no. 112/98) in order to understand if national legislation has fully implemented the Directive. In particular, we evaluate concrete activity control of plants at major accident risk, second the following conditions:

- a) regional legislation adoption about accident events (article no. 72 par. 2 of L.D. no.112/98);
- b) activation of ARPA, referred to article no. 3 of Law Decree no. 496 of 4 December 1993, converted with amendments in Law no. 61 of 21 January 1994 (IP, 1994);
- c) State-Region Agreement Program conclusion aimed at condition verification for carrying out the functions.

The first condition is implemented in some Regions (Emilia Romagna, Lombardy, Marche, Apulia and Tuscany). Other Regions (as Abruzzo, Basilicata, Piedmont, Sicily, Umbria, Veneto) shall to control of industrial plants mentioned in article no. 6 of Decree (IG, 1999), by the ARPA. They regulate their activities by administrative acts (Regional Council resolutions and/or executive acts).

The second condition is implemented in all Italian Regions by establishment of ARPA.

The third condition (relating to signing of State–Region Agreement Program) it isn't realized in Region. Recently, the Environmental Ministry has shown interest at signing Agreement Program provided that the Regions ensure funds availability and professional skills to implement of Decree (IG, 1999).

The conclusion failure of agreement program is justified by a lack of local legislation about accident major hazards for some Regions, in other cases it is justified only by absence of state political will.

Therefore, there is a need to reorganize the whole control system. The results will be achieved if there is a decentralization of functions at regional level, as required by same Title V Constitution reform, and resources availability for Administrative and technical bodies, by introduction e.g. of a Tariff System against of operators of establishments at Major Accident Risk (pursuant to article no. 29 par. 1 of Decree) (IG, 1999). Moreover, it is desirable to specify allocation of resources resulting by National Action Plans and/or by management Risk of area.

3. Future regulatory requirements

In Italy, there are about 1,090 plants at Major Accident Risk (about 41 in Apulia).

In North Italy there is a high concentration of risk plants but South boasts the presence of many industrial poles at Major Accident Risk.

This for the presence of high environmental crisis risk areas and industrial complex poles, as cities Brindisi, Taranto, Priolo, Gela, Porto Torres, and for the presence of older industrial plants (over 50 years old) that requiring more control.

Concurrently at the need to proceed at transfer of functions from State to Regions, it appears necessary the implementation of "Tariff Decree" and of performing mode audits and security reports evaluation. In addition, there is need to have laws to regulate the safety of high concentration industrial plants area, of "Risk Area" and of "planning Intervention".

In particular, in order to enable an integrated approach to industrial hazards assessment, there is a need to enactment a Decree that defines the identification criteria of "Domino Effect" and of "Environmental Consequences". This requirement stems from need to assess substantial modification demands of existing plants or to identify location of new industrial plants so to allow to assess consequences about pre-existing level of risk; especially in high industrial concentration areas, as e.g. in Apulia (Brindisi and Taranto cities). In addition, the article no. 29 *nonies* of Legislative Decree no. 152 of 3 April 2006 (IG, 2006), relative the IPPC implementation and major accidents prevention, presents serious critical issues. And administrative-sanctionative regime for the implementation of BAT to reduce environmental emissions and accident prevention is uncertain.

Finally, the CTR carry out investigation activities in absence of specific provisions aimed at codifying provisions of article no. 19 of Decree (IG, 1999). Some CTR have "internal regulations" and application criteria, but often these have uncertain origin.

There is, also, uncertainty about the rules established by supervisory authorities: think that suggestions given by the Commission of Environment Ministry, or by regional ones, can be implemented as part of

the preliminary investigation, under article no. 21 of Decree (IG, 1999), but in delay respect time when the same were issued. In fact, the Interior Ministry Circulars don't allow to overcome that a collegial technical body, such as CTR, must necessarily transpose the proposals evaluated by other Control Authority.

4. Possible reorganization of duties and problematic aspects of implementation of EU directives

In order to transferring programmatic functions and coordination of territory to Regions, ARPA are attributed to the functions of analysis and control of industrial processes. For a general reorganization, it emphasizes importance of ISPRA coordination for establishment of sector-specific technical standards and guidelines of reference in order to maintain the criteria of "uniform rules" and "adequacy of standards of care" for all regional areas.

The provincial and municipal governments need to adapt their planning instruments in a continuous and iterative process by varying the productive activities ratio at risk and the urban settlement structure, peri-urban and regional context. Control activities are affected by failure transfer of functions from State to Regions, that, even accidentally, creates a duplication of roles and overlap of competence functions of a technical body which should be characterized by high and diversified technical specializations in chemical processes and industrial safety. In particular, this is an obstacle to practical realization of goals set forth by Decree and European Directives (2003/105/EC the last) in the complexity of the legal order and in stratification of legislation.

It should be noted that a technical body, composed of government officials belonging to various ministries, or central government and officials of local authorities (regional, provincial and municipal level) and technical officers of institutions (ARPA), does not contribute to simplification of procedures and to responsibility for decisions taking.

In fact, the contribution of more subjects and institutions can lead to a dissolution of responsibility in taking decisions which, in cases of risk of serious injury to environment and public safety, determines the absence of identification of a competent. The stable connection of each CTR component with the membership administration does not offer sufficient guarantees of independence. Similarly, it should be noted that the finding of a breach of sanctions, including article no. 27 of Decree (IG, 1999), is delegated to aforementioned technical body which has problems of accountability and independence.

In fact, jurisdiction of criminal court, in technically complex activities, does not allow for effective action due to the absence of any relationship and regulation between contraventions, under article no. 27 of Decree (suspension of activities, revocation of seizure or, even, positive verification of prescription checking of supervisory authority) and about the requirements deriving from action punitive that could also lead to different solutions given the distinction between the field of criminal court and that active administration. Not entering into criminal and administrative discipline imposed by legislation, it should be noted that in case of an accident event with serious injury and / or manslaughter within of ordinary jurisdiction of the court, the interference between administrative responsibility within the competence of the supervisory authority (article no. 27, par. 4.) criminal responsibility (article no. 27 par. 1,2,3,5,6) and responsibility of society (pursuant to art. 25 *septies* of Legislative Decree no. 231 of 08 June 2001) (IG, 2001) can mutually interfere during the investigation (administrative or criminal).

For example, in the event of a major accident it should be noted that on the one hand there is need to investigate criminal justice about criminal liability of individuals and administrative responsibilities, and on the other, obligation of vigilance and active cooperation that the law requires the Plant Manager. He is called upon to immediately ascertain the cause of accident event (both to the administrative authority and to criminal justice).

Although it is believed that Legislator has given attach importance to protect collective interests, provided for article no. 24 of Decree (IG, 1999), it is noted that foretold interference not clearly regulated, it can lead (and, indeed, cause) an interruption of the information flow from the Manager to supervisory authority which determines an inadequate respect of principles of European Directive no. 105 of 2003 (EC, 2003). Article no.14 requires to only one person (the Manager) an active behaviour which favours a complete understanding of accident events, of the substances involved and of remedies to be taken to prevent further accidents. In fact, the European directive no. 105 of 2003

foresees the protection of investigation secrecy only in reference to disclosure of information for the population and not in relation to those that the manager must provide to other competent authorities. In any case, it is noted that there are numerous provisions of national legislation providing for a continuous updating of the rules SMS implementation.

In fact, they must start from accident historical analysis which occurred on plants and similar processes, as well as from analysis of operating experience. In particular, in reference to major accidents, the failures of process are due to primary inputs of a risk analysis, to index of instability of processes and potential anthropogenic stressors (e.g. input of unburned torch). The prediction of a hypothesis contravention, provided for in article no. 27 par. 3 of Decree (IG, 1999), in case of refusal of the Plant Manager to provide necessary information to reconstruct accidental causes does not appear adequate to ensure the acquisition of necessary data in cases where the Manager does not want to cooperate. The absence of cooperation by the Manager is certainly not suitable for control of observance of law about major accident prevention. The discipline paradoxically is strict and binding at the time of issuance of the preliminary authorization to operate the plant. It is able to leverage the denial of "no impediment to feasibility", prerequisite to startup of industrial plant, and not equally effective in case of occurrence of a major accident due to absence of enforcement in-chief to Control Authority.

5. Conclusions

The European regulatory framework about risks controls was described through three successive directives transposed at national level.

The control activities carried out in Italy are in line with those carried out in other EU countries with a substantial alignment to European standards. Although it's need an improvement of evaluation process about safety reports and an increase of control inspections.

Thus, skill and economic resources are useful also through integration with Integrated Environmental Authorization (AIA) procedures. It requires an administrative functions reorganization through the transfer of administrative powers from State to Regions, relating of accident hazards control pursuant to article no. 72 of L.D. no. 112/98 (IP, 1998).

Finally, being that there are various control authorities but it isn't specified the responsible of entire process, the control functions are uncertain, there is an interference relationship between various authorities, and if industrial plant Manager doesn't cooperate it isn't possible capture necessary information, it isn't possible now to establish an effective actions system aimed at production processes continuous improvement, in line with targets set by EU directives.

References

- Constitutional Court, July 24, 2009 - Case no. 249 of 2009.
- CMP (Council of Ministers Presidency), 1982. Presidential Decree no. 577 of 29 July 1982 on the fire prevention to safeguard human life and protect property and the environment, Official Journal no.229 of 20 August 1982.
- CMP (Council of Ministers Presidency), 1988. Presidential Decree no. 175 of 17 May 1988 on the major-accident hazards of certain industrial activities, Official Journal no. 127 del 01 June 1988.
- EC, 1982. Council Directive 82/501/EEC of 24 June 1982 on the major-accident hazards of certain industrial activities, Official Journal, L 230 , 1 – 18.
- EC, 1996. Council Directive 96/82/EC of 9 December 1996 on the control of major-accident hazards involving dangerous substances. Official Journal, L 010, 13 – 33.
- EC, 2003. Directive 2003/105/EC of the European Parliament and of the Council of 16 December 2003 amending Council Directive 96/82/EC on the control of major-accident hazards involving dangerous substances. Official Journal, L 345 , 97 – 105.
- EM (Environmental Ministry), 2000. Ministerial Decree of 9 August 2000 on the management of major incident risk, Official Journal no. 138 of 16 June 2001.

- IG (Italian Government), 1999. Legislative Decree no. 334 of 17 August 1999, Seveso – Bis, Official Journal Ordinary Supplement no. 228 of 28 September 1999.
- IG (Italian Government), 2001. Legislative Decree no. 231 of 08 Jun 2001 on the regulations governing the administrative responsibility of corporate bodies, companies and associations with or without legal liability, Official Journal no. 140 of 19 June 2001.
- IG (Italian Government), 2005. Legislative Decree no. 238 of 21 September 2005, Official Journal Ordinary Supplement no. 271 of 21 November 2005.
- IG (Italian Government), 2006. Legislative Decree, no. 152 of 03 April 2006 on the Code on the Environment, Official Journal no. 88 of 14 April 2006 – Ordinary Supplement no. 96.
- IP (Italian Parliament), 1994. Law no. 61 of 21 January 1994 on the creation of the National Environmental Protection Agency (ANPA), Official Journal no. 21 of 27 January 1994
- IP (Italian Government), 1998. Legislative Decree no. 112 of 31 March 1998 on the administrative decentralization, Official Journal no. 92 of 21 April 1998 – Ordinary Supplement no. 77.
- RC (Regional Council), 2008. Law no. 6 of 7 May 2008, Regional Official Journal (BURP) no. 76 of 14 May 2008, 12-26.