

# LEGISLATIVE DEVELOPMENT AND MANAGEMENT HEALTH AND SAFETY IN MAINTENANCE CONSTRUCTION SITES

RENATO LAGANÀ

*DARte, Università Mediterranea of Reggio Calabria, Reggio Calabria, Italy*

When considering the maintenance of buildings, the implementation of legislative codes for health and safety requires particular attention as early as in the design approach. Statistics indicate that accidents often occur during maintenance operations. The organization of the maintenance yard requires specific safety measures, which often depend on the choices related to the design and construction of a building. European Directive 57/1992 indicates that “the architectural and/or organizational measures are not enough. A poor design frequently causes work-related accidents in construction sites with significant damage to the community.” This statement, dating back 22 years, is still valid in Europe today. The introduction of the obligation to draw up the Safety File, to manage safety in the maintenance tasks of the building life cycle, is still valid. This paper refers to the maintenance tasks programmed by ensuring safety conditions. Particular focus is on the individuation of the types of risks in relation to design. The design choices, likewise, are made in order to have an effective plan of health and safety for the workers. The preventive identification of the most common natural risks, and the application of practice codes related to maintenance programs, are the most important strategic choices to ensure safety in interventions deferred over time.

*Keywords:* European directives, Italian law, Safety management, Safety file.

## 1 INTRODUCTION

The most recent statistics from Eurostat (the office responsible for providing the European Union statistics that enable comparisons between European countries and regions) point out that the 10-15% of all fatal accidents are related to maintenance operations (Laganà 2003).

In these activities, the highest percentage of fatal accidents, compared to the European total, has been registered in Italy. The most common occupational diseases between the operators of the area are asbestosis, cancer, hearing problems and musculo-skeletal disorders (Muylaert *et al.* 2010, Sas 2010). In recent years, the economic crisis has significantly reduced the number of new construction sites, making building maintenance the more-developed building sector. Maintenance work on the more complex modern buildings were added to those of the oldest ones. They are characterized by a higher incidence of elements that require more frequent reviews.

## 2 EUROPEAN DIRECTIVES AND BUILDING MAINTENANCE IN ITALY

The European Standard EN 13306 defines maintenance as “the combination of all the technical, administrative and managerial actions during the life cycle of an element intended to retain or restore it to a state where it can perform the required function.” It follows that the maintenance, extended to the buildings, is an activity that must ensure the restoration of the initial performance during the life cycle of the construction and its parts. The absence of maintenance can cause dangerous situations, and damage to the health of users and the resident population.

The activities associated with maintenance include inspection, measurement, repair or replacement of components, verification and functionality of the systems phases, etc. Consequently, maintenance is a high-risk activity and it should be carried out safely, using appropriate protections for workers and for other people in the workplace.

Under a directive introduced on 24 June 1992, n.57/1992 the European Union Council imposed the adoption of requirements regarding the safety and health of workers in temporary and mobile sites to the Member States. The following year, Annex II to Document 05/26/93 specified the site characteristics. According to the document, listed as the Health and Safety File, the construction characteristics and the relevant information related to health and safety should be recorded. These regulations must be taken into account in the execution of any subsequent maintenance and repair work. The “file with the characteristics of the work” must take the form of control cards, divided into sections that could be modified at will by the individual European Union Member States. The goal, i.e., exceeding the “insufficient organizational choices” of the projects (which did not take into account certain building operations to ensure the efficiency of the structure and systems), was to provide new devices and technical solutions for the new structures to ensure safety during maintenance.

Legislative Decree 494, issued in March 1996, in the transposition of Community regulations, obliged (Article 4) the Safety Coordinator for the design to prepare, in addition to the Safety Plan, “a dossier containing the useful information for the prevention and protection of the risks to which workers are exposed”. It was stated that the dossier must be taken into account during any subsequent construction work, and it should be drawn up “taking account of the specific standards of good practice” and of the contents of the abovementioned EU Annex II. It was up to the safety coordinator to adapt the safety and coordination plan to the files on the progress of the work, and to any changes made to the site. Besides summarizing the project documents, this dossier must offer a description of procedures for the use and maintenance of structures built over time to the future executors of the work. The specific contents of this project document would be issued with a subsequent decree by a specific “Accident Prevention Commission”, composed of members of the relevant ministries (Labor and Social Security, Industry, Health, and Public Works), to be taken in the six following months. The tasks stated in paragraph 3 of Article 4 were not accomplished. The Safety Coordinator can reference the Annex II of the European document, but often many people omitted its drafting, using the pretext of the non-specific instructions. The following Decree of November 19, 1999, no. 528 (“Amendments and additions to the legislative decree of 14 August 1996 no. 494 ...”) that conform the rules to the New Regulation of Public Work (Law n.109/1998) repropounded that which was already contained. The fixing of the contents of the File was put off again for another six

months. Neither the Decree of the President of the Republic on July, 3 2003 no. 222 (Regulation on the minimum content of safety plans at temporary or mobile sites, in implementation of Article 31, paragraph 1, of the Law of 11 February 1994 no. 109), published in August 2003, provided specific instructions on the drafting of the project document. It merely analyzed the contents of the safety plans and indicated the procedures for calculating the expenses of safety. Only in 2008 were the contents of the Health and Safety File clarified, with the passage of the Consolidated Law on Health and Safety in the Workplace.

Article 91 of the aforementioned Consolidated Law specifies that the document should contain useful information for the prevention and protection against risks to which workers are exposed. It must be taken into account at the time of any subsequent work on the construction (maintenance) and it must accompany the work throughout its life. It should be noted that for public works, the Safety File shall take account of the work Maintenance Plan and of its parts, as an executive project document.

The drafting of the Safety File is one of the main duties of the design coordinator, according to Art. 91 (paragraph 1, letter b) of Legislative Lgs.81/2008. The omitted preparation of the Safety File is included among the penalties, and it mandates a fine of between 3,000 € and 12,000 € (one of the highest penalties provided by the Legislative Decree) and a prison sentence from three to six months. Moreover, in the absence of the Health and Safety File, the efficacy of the qualifying title is suspended, thus determining the suspension of the work (Laganà 2012).

Annex XVI of the Consolidated Law contains specific instructions to be observed in the arrangement of the document that:

- Must be the result of a careful risks analysis, put into effect by the design Coordinator, to identify preventive options to reduce risks at its source;
- Must integrate into the work the systems and devices that can prevent or minimize risks during the subsequent work.

The rules also indicate the Health and Safety File should be updated by the customer after any changes in the work during its existence. If it is related to a specific building, the file must be transferred with the lease in case of ownership changes. The contents of the Safety File, which is configured as the basis for the installation of the future building maintenance sites, is divided into three parts, organized with summaries:

- Arrangements for the work description and for the identification of stakeholders;
- Identification of risks, preventive and protective measures provided for the work and the auxiliary ones;
- References for the definitions within the supporting existing documentation.

The preventional choices to be adopted (that should be planned and integrated during the preparation of the project) are essentially related to the following “critical points” of the maintenance activity:

- Access systems to workplaces (walkways, stairs, etc..) to perform the needed interventions;
- Security systems and protections of the workplace (type, location, work to be performed, equipment used, etc.).
- Systems and anchoring points for the individual and collective protection (type, location, allowable loads, etc.).
- Procurement and material handling areas (type and measurements previously evaluated);
- Energy feeding systems for the equipment that should be used to light up the work areas;
- Access and parking routes and operational areas for machinery and equipment, in addition to storage areas for the materials;
- Specific information on occupational hygiene, hazardous materials and methods of installation to bring down the health risks;
- Procedures to minimize the risks of interference between multiple work teams and to protect third parties in the course of maintenance work.

The Safety File will give risk instructions and report the preventional choices, even if it does not get to the heart of the specific risks or risks. The Risk Assessment Document indicates the pre-arranged measures and the people in charge of implementing them. It also provides information about the preventive and protective measures belonging to the work. They are required to plan in terms of safety, create the information about the operating procedures for complete safety, and to keep them in full functionality over time. The checks, the required maintenance work, and their frequency must also be identified.

Due to unclear regulations, added over the years in the design documents, definitions have led many professionals to underestimate the importance of the measures. We refer to the Maintenance Plan, scheduled for public works (first it was Article 16 of Law 109/1994 and Presidential Decree 554/1999; today it is the Dlvo 163/2006 and its subsequent amendments), which is responsible for providing guidelines for maintaining the structure's efficiency and economic value. Another document, similar in name, is the Building File (introduced by the regional laws of Lazio and Campania between 2000 and 2002), for monitoring the health status of buildings with the aim of the protection of "the public and private safety". In the light of some professional experiences, with standard investigation, it was discovered that on five tasks, performed on buildings developed in the last twenty years (and thus subject to the drafting of the Safety File), only two of them had considered the information provided in the document drawn up at the time of the construction. For the other three cases, two cases had the document unavailable, and for the third, the Safety File was not updated by the execution Coordinator (Laganà 2013).

Another potential issue is related to the type of firm that performs the building maintenance. Over 70% of maintenance is performed by small businesses that are often not fully complying with the Health and Safety procedures in construction sites. In the

Italian context, according to recent statistics on accidents in maintenance yards, the causes of fatal accidents or serious diseases (mainly affecting small and medium-sized firms) can be traced back to:

- Falls from heights during work on sloping roofs (including work with solar panels);
- Electrocution during the maintenance of facilities;
- Onset of asbestosis for the release of asbestos particles during electrical, plumbing and heating refurbishment;
- Asphyxia in work within tunnels, chimneys, tanks and confined spaces.



Figure 1. Workers performing maintenance coverage without necessary protection.

For supporting operators under the health and safety guidelines, the National Insurance Institute in the Workplace (POS), with the Regional Coordination of the Territorial Joint Committees of Sicily, Messina and Torino, have created a guide for safety in the building industry (est. 2011). In the bibliographic records are useful tips about injury prevention in the maintenance and repair activities. Thanks to this initial focus on safety management in maintenance activities, some Italian regions have introduced specific regulatory measures. To improve the security of building checks and/or repairs, the Veneto Region, by Resolution No. 97 (2012) of the Regional Council of January 31, has ordered that maintenance projects on existing buildings provide appropriate preventive and protective measures for the safety of work carried out at high altitude. In the same year, the Permanent Advisory Commission for Safety and Health at Work approved the rules of good practice for maintenance activities related to electrical work.

A recent government decree, Decree of Making, converted with the Law 134 of 7 August 2013, has started procedures to implement simplification measures in temporary and mobile sites. The pertinent ministries (Labor and Infrastructure) will provide adoptable, simplified models “for the writing of the operational safety plan, of the safety and coordination plan, and of the file containing the information useful for the prevention and protection against risks to which workers are exposed” (Gottfried *et al.* 201b).

Among the most recent legislation, one from the Toscana Region, issued on December 2013, regarding “preventive and protective measures for the access, transit

and execution of work at height in safety conditions”, deserves attention. It provides new technical directions affecting the coverage of new and existing buildings, applying appropriate preventive measures for subsequent maintenance. To support the initiative a website has been created (coperturassicura.toscana.it) to help professionals, building firms, and administration.

### 3 CONCLUSIONS

Safety management on and around maintenance sites seems to have gained a new momentum in Italy after the establishment of the Consolidated Law. Due to the current economic situation, the real estate market has oriented its activities towards the maintenance sector, urging the authorities and institutions to promote actions that solve the problems of the area.

The issues in relation to fields where a high incidence of work accidents have occurred are the specific training of the employees, adequate professionalism of the technicians, and a policy of involvement of small and medium-sized firms about prevention (Gottfried *et al.* 2013a). On these directives have been the most recent legislative measures. However, to find out an objective correspondence, it will be necessary to wait a few years to get statistical evidence that allows verification of the achievement of the expected results.

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