**SAPIENZA UNIVERSITY OF ROME**

**Faculty in Engineering**

**Department of Mechanical and Aerospace Engineering**

Master of Science in Mechanical Engineering

Safety and Maintenance for Industrial Systems

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**Safety, Health and Coordination Plan**

**Construction Site by**

**Luxottica Group Spa**

**(ONLY 9 CFU STUDENTS)**

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Academic Year 2021-2022

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**PART II**

**MINIMUM CONTENTS OF THE PLAN**

**(ANNEX XV D.Lgs. 81/08 and ANNEX IV 92/57 EEC)**

a) the identification and description of the work, made explicit with:

1) the site address;

2) the description of the context in which the construction site is located;

3) a brief description of the work, with particular reference to the design, architectural, structural and technological choices;

b) the identification of the subjects with safety tasks, made explicit with the indication of the names of the works supervisor, the safety coordinator in the design phase and, if already appointed, the safety coordinator in the execution phase and care of the same coordinator for the execution with the indication, before the start of the single works, of the names of the employers of the executing companies and of the self-employed workers;

c) a report concerning the identification, analysis and assessment of concrete risks, with reference to the area and the organization of the construction site, to the processes and their interference;

d) design and organizational choices, procedures, preventive and protective measures, with reference to:

1) to the construction site area;

2) to the organization of the construction site;

3) to processing;

e) operational requirements, preventive and protective measures and individual protection devices, with reference to interference between processes;

f) coordination measures relating to common use by several companies and self-employed workers, such as the choice of work planning aimed at safety, preparations, equipment, infrastructures, means and collective protection services;

g) the organizational methods of cooperation and coordination, as well as mutual information, between employers and between them and self-employed workers;

h) the organization envisaged for the first aid, fire prevention and evacuation service of workers, in the event that the emergency management service is of a common type; the PSC also contains the telephone numbers of the structures provided in the area for the first aid and fire prevention service;

i) the expected duration of the work, the work phases and, when the complexity of the work requires it, the work sub-phases, which make up the work schedule, as well as the presumed size of the construction site expressed in man-days;

l) the estimate of the costs of safety.

The type of complementary and detailed procedures to the PSC itself and related to the autonomous choices of the executing company, to be specified in the POS.

The PSC is accompanied by explanatory project tables, relating to safety aspects, including at least one floor plan and, where the particularity of the work requires it, an elevation profile and a brief description of the hydrogeological characteristics of the land or a reference to a specific report.

**PART III**

**MINIMUM CONTENTS OF THE PLAN IN REFERENCE TO THE CONSTRUCTION SITE AREA, THE ORGANIZATION OF THE CONSTRUCTION SITE, THE WORK**

**(ANNEX XV D.Lgs. 81/08 and ANNEX IV 92/57 EEC)**

1. With reference to the construction site area, the Plan contains the analysis of the essential elements in relation to:

a) the characteristics of the construction site area, with particular attention to the presence in the construction site area of ​​overhead lines and underground pipelines;

b) the possible presence of external factors that pose risks to the construction site, with particular attention:

b1) to road and motorway works in order to guarantee the safety and health of the workers employed against the risks deriving from the surrounding traffic,

b2) the risk of drowning;

c) any risks that construction site works may entail for the surrounding area.

2. With reference to the organization of the site, the Plan contains, in relation to the type of site, the analysis of the following elements:

a) the procedures to be followed for the fencing of the construction site, the accesses and the signals;

b) sanitation services;

c) the main road system of the construction site;

d) power plants and main networks of electricity, water, gas and energy of any kind;

e) earthing and protection systems against atmospheric discharges;

h) any methods of accessing the means of supplying the materials;

i) the location of the site facilities;

l) the location of the loading and unloading areas;

m) the equipment storage and material and waste storage areas;

n) any storage areas for materials with a risk of fire or explosion.

3. With reference to the work, the design coordinator divides the individual processes into work phases and, when the complexity of the work requires it, into work sub-phases, and carries out the analysis of the risks present, with reference to the area and organization of the construction site, work and their interference, with the exception of those specific to the company's business, paying particular attention to the following:

a) the risk of being run over by vehicles circulating in the site area;

b) the risk of burial in excavations;

b-bis) the risk of explosion resulting from the accidental triggering of an unexploded military device found during excavation activities; 22

c) the risk of falling from above;

d) the risk of unhealthy air in tunnel works;

e) the risk of instability of the walls and vault during tunnel works;

f) the risks deriving from extensive demolition or maintenance, where the technical implementation methods are defined in the design phase;

g) the risks of fire or explosion associated with hazardous materials and processes used on site;

h) the risks deriving from excessive changes in temperature.

i) the risk of electrocution;

l) the noise risk;

m) the risk from the use of chemicals.

4. For each element of the analysis the Plan contains:

a) design and organizational choices, procedures, preventive and protective measures required to eliminate or minimize work risks; where necessary, explanatory technical drawings and tables must be produced;

b) the coordination measures to implement the provisions of letter a).

**PART IV**

**MINIMUM CONTENTS OF THE PLAN IN REFERENCE TO INTERFERENCE BETWEEN PROCESSES AND THEIR COORDINATION**

1. The design coordinator carries out the analysis of the interferences between the workings, even when they are due to the work of the same contractor or the presence of self-employed workers, and prepares the work schedule.

2. With reference to the interferences between the processes, the Plan contains the operational prescriptions for the spatial or temporal displacement of the interfering processes and the procedures for verifying compliance with these prescriptions; if there are still risks of interference, it indicates the preventive and protective measures and the individual protection devices, designed to reduce these risks to a minimum.

3. During periods of greatest risk due to work interference, the coordinator for the execution periodically checks, after consulting the construction management, the executing companies and the self-employed workers concerned, the compatibility of the relative part of the Plan with the progress of the works. updating the plan and in particular the work schedule, if necessary.

4. Coordination measures relating to the common use of preparations, equipment, infrastructures, means and collective protection services are defined by analyzing their common use by several companies and self-employed workers.

5. The coordinator for the execution of the works integrates the Plan with the names of the contractors and the self-employed workers required and, after consulting the executing companies and the self-employed workers concerned, indicates the relative chronology of implementation and the methods of verification.

**PART V**

**ESTIMATE OF SAFETY COSTS**

The following costs must be estimated in the safety costs for the entire duration of the work foreseen on the site:

a) the preparations envisaged in the Plan;

b) of the preventive and protective measures and of the individual protection devices possibly envisaged in the Plan for interfering processes;

c) earthing and protection systems against atmospheric discharges, fire-fighting systems, smoke evacuation systems;

d) collective protection means and services;

e) the procedures contained in the Plan and provided for specific safety reasons;

f) any interventions aimed at safety and required for the spatial or temporal displacement of the interfering processes;

g) coordination measures relating to the common use of preparations, equipment, infrastructures, means and collective protection services.

2. For works falling within public works (Legislative Decree n. 163 of 12 April 2006 and subsequent amendments), the contracting administrations, in the safety costs, estimate, for the entire duration of the work foreseen on the site , the costs of preventive and protective measures aimed at the safety and health of workers.

3. The estimate must be congruous, analytical for single items, per unit or to measure, referring to standard or specialized price lists, or based on price lists or official price lists in force in the area concerned, or on the price list of the client's security measures; in the event that a price list is not applicable or not available, reference will be made to complete cost analyzes derived from market surveys. The individual items of safety costs must be calculated considering their cost of use for the site concerned which includes, when applicable, installation and subsequent disassembly, any maintenance and depreciation.

4. The safety costs thus identified are included in the total amount of the work, and identify the part of the cost of the work not to be subjected to a reduction in the offers of the contracting companies.

**Attachments (9 CFU)**

1. General plant of the factory

2. Building plant

3. Machine layouts

4. Other technical documents

**References**

[1] M. Provost, The Use of Optimal Estimation Techniques in the Analysis of Gas Turbines, Ph.D. Thesis, Cranfield University: Cranfield, UK, 1994.

[2] Clifton, D.A.; Bannister, P.R.; Tarassenko, L. Application of an Intuitive Novelty Metric for Jet Engine Condition Monitoring, Advances in Applied Artificial Intelligence. In Lecture Notes in Artificial Intelligence; Wang, J. Eds.; Springer-Verlag: Berlin, Heidelberg, 2006, Volume 4031, pp. 1149–1158.

**1. Introduction to the case study and objectives**

Wòlj flwqj flqkjw lqkj ljòlj flkj elfjqlkewjgf (Figure 1) lknclkwlckn lkqhjelhfvlhqvklhqklvchlkq .dcn qwlkfdh jwqhdjh uwskjq kjhshxih



**Figure 1 – Example of a mechanicl system**

AhcjahvscjV ASCJKJsc ljkcjkqC (Table 1) qwdxjhgv xgcx qwidy qlkc qkjckjhqcjk.

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Table 1 – Example of a table