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PURPOSE OF THIS QUESTIONNAIRE

The INESS project is a 35 member consortium comprised of European railway administrations and members of the European railway supply industry, established in response to the 7th Framework call for funding for the European Commission. The INESS project has the objective of increasing the standardization between the different building blocks of railway signaling command and control systems, and particularly the interlockings within them, thereby creating the potential for a reduction in costs of such systems and therefore the improved competitiveness of railway transportation compared with other modes.

More information about the INESS project can be found on the INESS website, <http://iness.eu/>

The INESS project has a number of workstreams by which it is intended to achieve its objectives.

One of these workstreams, called Workstream F, is focusing on those activities that relate to testing and commissioning of railway signaling command and control systems, with a view to making these processes as efficient as possible in terms of cost, resources and timescales.

To achieve this objective, the Workstream F team considers it necessary to understand as much as possible about how different administrations and organizations presently approach the subject of testing and commissioning of railway signaling command and control systems. It is felt that to proceed otherwise would create the risk of not having the widest possible understanding of the tools and techniques used during testing and commissioning of railway command and control systems.

The INESS Workstream F consider

- Testing to be physical activities carried out by human beings or automated system to be satisfied that a designed product or system will function as required to the required levels of reliability, availability and safety.
- Commissioning to be activities carried out generally during the course of the act of changing one railway command and control system to another for the purpose of operating a railway transport system.

This questionnaire is therefore issued by the INESS Workstream F team in order to start seeking information about the state of the art concerning testing in railway signaling Command and Control systems.

The scope of the questionnaire's is all the test process and procedures adopted both by industries in developing products for use in railway signaling command and control systems and for railway authorities in buying products from manufacturers, and applying the manufacturers' products as part of their administrations.

In this first questionnaire we are seeking information from railway administrations and railway supply industries concerning the following three specific groups of activities

- Testing activities used as part of the process of accrediting generic products or sub-systems as being fit for purpose to use in a railway signaling command and control system in order to put the equipment into the market place.
- The use of testing activities as part of the process of acquiring a railway signaling command and control system from a supplier (particularly if it is the first use of a particular type).

Description of the steps taken to test and commission a railway signaling command and control system by a railway administration and/or a supplier to a railway administration with the objective if that system controlling trains on a railway administration's network, and, where applicable, obtaining approval to use that system from a safety regulatory body or other authority.

This first stage of this data gathering is focused in trying to obtain general information of these three main issues. The questionnaire is divided into these three processes.

Testing is usually an important process in the life cycle of a signaling system both in cost and time. As said before, the main goal of this questionnaire is presently to obtain information of how test is carried out.

On the basis of your responses, we may wish to contact you to discuss them to make sure that we have fully understood what you have told us. We hope you will be able to help us with this task.

SECTION 1 – ACCREDITATION PROCESS OF A RAILWAY SIGNALING SYSTEM

This first part of the questionnaire is focused in describing the process for developing a new railway signaling command and control system is carried out and what part does testing has to do with it. This first part of the questionnaire concerns mainly railway industries as railway administrations are not usually involved in this process. However, if you are a railway administration that does undertake this type of work, we would like to hear from you as well.

Having developed a railway signaling command and control system, there is usually an accreditation process which needs to be carried out by a railway industry in order to obtain some form of ‘approved’ or ‘compliant’ label according to standards required by railway administrations or legal requirements. In Europe, typical standards that many suppliers and railway industries will take account of will include EN 50129, EN 50126, IEC 62278, IEC 62425, and certain tests may be necessary to demonstrate compliance with them. If other standards than these are used, we would like to know what they are, and what sort of tests may be used as part of the compliance demonstration, or whether there are any other testing requirements that may be mandatory in some countries or administrations.

The aim of this part of the questionnaire is to obtain a general view of this process and especially how testing is done and what importance tests have in the whole product development and marketing process.

1.1 Questions concerning accreditation process of for railway signaling command and control system products

- 1 According to what railway, national, international or other standards do you usually take account of in developing your railway signaling command and control system products?
- 2 Can you briefly describe the main steps in the process of demonstrating your system fulfills the requirements of the standards in your marketplace in order to obtain the ‘compliant label’ according to the standards related before, and whether that process involves testing the product to assess its ability?
- 3 Could you give an estimation of how many people from your company are involved in this process?
- 4 Could you give an estimation of how many people from your company are involved in testing to obtain the compliance?
- 5 Could you give an estimation of how much time does the overall process take?
- 6 Could you give an estimation of how much time does testing take within this period?
- 7 What stages of the whole accreditation process do you understand as ‘testing processes’?
- 8 Can you accredit your own products? If not, please can you tell us which company or administration does it for you?
- 9 Do you perform the accreditation process in your own facilities? If not, please tell us where you held the accreditation process for your system.
- 10 Do you use a quality assurance process? If so, which one?

- 11 Does the accreditation authority demand you the use of a quality assurance process as a requisite in order to obtain compliance with a standard?

SECTION 2 – REQUIREMENTS FROM THE RAILWAY ADMINISTRATION IN ORDER TO ACQUIRE A SIGNALING SYSTEM

This part of the questionnaire is focused in what extra information, testing, processes and verification the railway authority requires from the railway suppliers as part of acquiring a railway signaling command and control system.

This part can be answered both by railway administrations and railway suppliers. The questionnaire is divided in two different parts, one concerning railway administrations and the other one concerning railway suppliers.

This part does not include questions concerning the compliance with generic standards but the compliance with railway administration specific requirements, and the standards those railway administrations may have.

2.1 Questions concerning requirements from the railway administration in order to acquire a signaling system (Railway administration questionnaire)

1. What standards do you, as a railway administration, ask a railway signaling command and control system to comply in order to acquire it? Please confirm if they are mandatory in your country, or for your administration
2. Do you carry out your own verification process in order to assure the system complies with the required standards? If so, could you describe this process?
3. Do you carry out testing to assess if the system complies with the standards you have set down?
4. Who identifies and plans these tests?
5. Do you as administration perform these tests with your own personnel? If you do, can you indicate how much resource that you have available to do this?
6. If you outsource these tests, can you give the name(s) of the company(ies) that you usually employ to performs these tests?
7. Which role does the original equipment manufacturer have in these tests?
8. Where are these tests performed? In your laboratories? In the supplier's laboratories? In an outsourced facility?
9. Do you perform hardware tests? If so which tools do you use to perform this task?
10. Do you perform software tests? If so which tools do you use to perform this task?
11. Do you perform functional tests? Could you describe them?
12. Do you perform safety related tests? Could you describe them?
13. Do you perform tests in order to check the specified Safety Integrity Level of the signaling system?
14. Could you give an estimation of how many people from your company are involved in this process?
15. Could you give an estimation of how many people from your company are involved in testing process on average in a year?

16. Could you give an estimation of how much time does the overall process for assessing a new railway signaling command and control system can take?
17. Could you give an estimation of how much time does testing take within this?
18. What stages of the whole verification process do you understand as ‘testing processes, and given the definition of testing given in the introduction to this questionnaire’?
19. Do you cross-accept compliance of other railway administration than yours? If you do, can you indicate what factors you take into account?

2.2 Questions concerning requirements from the railway administration in order to acquire a signaling system (Railway supplier questionnaire)

1. What standards do you, as a railway supplier, have to comply in order to supply a railway administration besides the one referred in the first part of this questionnaire? Please indicate the extent to which these are specific to a railway administration, and how much these may be specific to legal requirements in a particular country.
2. To what extent is it necessary to carry out specific tests to demonstrate the requirements of a particular railway administration or the legal requirements of a particular country are met?
3. Who carries out these tests?
4. Do you as supplier perform these tests?
5. Are they outsourced? If so, could you give the name of the company(ies) that you use to performs these tests?
6. What role does the railway administration have in these tests?
7. Where are these tests performed? In your laboratories? In the railway administration laboratories? Elsewhere?
8. Are you asked to perform hardware tests in order to demonstrate that the system fulfills the requirements asked by the railway administration? If so which tools do you use to perform this task?
9. Are you asked to perform software tests in order to demonstrate that the system fulfills the requirements asked by the railway administration? If so which tools do you use to perform this task?
10. Are you asked to perform functional tests? Could you describe them?
11. Are you asked to perform safety related tests? Could you describe them?
12. Do you perform tests in order to assure the specified Safety Integrity Level of the signaling system specifically to a particular railway administration?
13. Could you give an estimation of how many people from your company are involved in this process on average in a year?
14. Could you give an estimation of how many people from your company are involved in this type of testing process on average in a year?
15. Could you give an estimation of how much time does this process can take on average?
16. Could you give an estimation of how much time does testing take within this period?
17. What stages of the whole verification process do you understand as ‘testing processes’?

18. Do you know if cross acceptance between railway authorities concerning railway signaling systems take place, and if so, what testing is involved in demonstrating the ability to cross accept equipment from one application to another?

SECTION 3 – DESCRIPTION OF THE STEPS SINCE A SIGNALING SYSTEM IS APPROVED BY A RAILWAY ADMINISTRATION UNTIL IT'S INSTALLED IN A RAILWAY LINE AND IT'S ACCEPTED BY THE AUTHORITIES

In this part of the questionnaire, the aim is to understand the whole process once a railway signaling command and control system has been acquired by a railway administration until it's fully installed and brought into use to control trains and the role testing has in this whole process.

The questionnaire is again split in two different ones, one concerning railway administrations and one concerning railway suppliers.

3.1 Questions concerning the process of a railway administration purchasing a railway signaling command and control system until it's taken into use (Railway administrations questionnaire)

1. Could you describe the whole process between accepting new railway signaling command and control system products until they are installed and taken into use for operating a railway?
2. Could you describe what role testing procedures take in this process?
3. Who carries out these test procedures? Railway Administration Personnel? Contractors to the Railway Administration? The Supplier of the products or system?
4. How much of the testing is carried out "off-site", and how much testing is necessary once the system, or elements of the system have been installed at the site where they are to be used to control a railway?
5. Specifically how much time is spent testing "on site"? , Could you describe the types of test carried out on site, and why? Are they functional, safety proof...?
6. Could you give an estimation of how many people from your company are involved in this testing process on an average annual basis? If you contract people in to carry out this work, please treat these as if your own staff.
7. Could you give an estimation of how many people from your company are involved in testing process compared with the number of staff you contract in on an average annual basis?
8. Could you give an estimation of how much time does the process of designing, installing and testing and commissioning a new railway command and control system take on average?
9. Could you give an estimation of how much time does testing take within this period?
10. Do you perform hardware tests? If so which tools do you use to perform this task?
11. Do you perform software tests? If so which tools do you use to perform this task?
12. Do you perform functional tests? Could you describe them?
13. Do you perform safety related tests? Could you describe them?

14. Are testing procedures outsourced? If so, could you give the name of the company(ies) that you use to perform these tests?
15. Do you need an authorization from an authority (other than yours as a railway administration) in order to take a new the railway signaling command and control system into use? If so, could you describe the procedures in order to obtain that authorization, and what role tests have in this, if any?

3.2 Questions concerning the process of a railway administration purchasing a railway signaling command and control system until it's taken into use (Railway suppliers questionnaire)

1. Could you describe in general terms the whole process from the point at which a railway administration accepts your railway signaling command and control system products until it's taken into use?
2. Could you describe the testing procedures that generally will arise as part of this process?
3. Who carries out these test procedures? Does the railway administration expect you as the supplier to carry out the tests, or does the railway administration appoint his own staff, or an independent organisation to do this?
4. Do you as a supplier outsource testing procedures? If so, could you give the name of the company(ies) that performs these tests?
5. Could you give an estimation of how many people from your company are involved in this the overall process on an average annual basis?
6. Could you give an estimation of how many people from your company are involved in testing process (include staff that you contract in) on an average annual basis?
7. Could you give an estimation of how much time does the overall process take?
8. Could you give an estimation of how much time does testing take within the time indicated at 7 above?
9. Do you perform hardware tests? If so which tools do you use to perform this task?
10. Do you perform software tests? If so which tools do you use to perform this task?
11. Do you perform functional tests? Could you describe them?
12. Do you perform safety related tests? Could you describe them?