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SAFETY COMMISSION DATABASES SUPPORT

S. Petit, E. Sanchez-Corral

Abstract

A collaboration project between the Safety Commission (SC) and the Controls, Safety and Engineering databases group (TS/CSE) started last year. The aim of this collaboration is to transfer several SC applications from their local environments onto the D7i-MTF EDMS framework, for which the TS/CSE group is responsible. Different domains of activity and projects have been defined in the areas of equipment management, safety inspections, accidents and risks management. Priorities have been established in collaboration with SC.
This paper presents the new Safety Inspections Management system (SIM) which will be put in production before the summer 2005 and reviews the constraints of both the users and the development and operational framework that needed to be taken into account. The technical solutions adopted to assure a successful production start-up and operation of the SIM system are described. Progress on other on-going projects and plans for the next year are also reported**.**

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1 INTRODUCTION

A collaboration project between the Safety Commission (SC) and the Controls, Safety and Engineering Databases Group (TS/CSE) started last year. The aim of this collaboration is to transfer several SC applications from their local computing environments which are endangered by obsolescence onto the D7i-MTF EDMS framework, which is able to offer a secure, long term future for both users and data. If the requirements collected from the different user communities in SC indicate that a completely new system has to be designed and implemented then a review of the efforts required is to be done. Different domains of activity and projects have been defined in the areas of safety inspections, accidents, risks management and equipment management. As the TS/CSE group is responsible for the CERN equipment management and SC has to ensure the safety of the equipment and sites, this collaboration is natural.

Priorities have been agreed upon in common and established in collaboration with SC. TS/CSE reports to SC on projects progress periodically at the SC databases forum monthly meetings.

The general requirements [1] expressed by the Safety Commission for all databases and interfaces to be developed within the scope of this collaboration project can be summarized as follows:

- Ensure the interaction with other systems and databases (SC, CERN-wide Patrimony, SOS, HR, Suppliers, Contracts, etc).
- Preservation of the confidentiality of the data in the interaction among systems or the access to data by any method.
- Support and maintenance of all the systems by the TS/CSE group to ensure the correct operation of the different systems.
- Regular updates in order to integrate new requirements of the users.

The main objective of the TS/CSE group in this collaboration is to provide a good service to SC within the minimum cost using the Group's D7i-MTF EDMS framework and methods, and limiting the specific developments to only very exceptional cases. At the same time, new features shall be implemented for the benefit of all. Our goal is to satisfy the SC users and provide them a good support within the resources available and foreseen by the management.

The currently ongoing projects that are under study or implemented are:

- Safety Inspection Management
- Radioactive Source Management
- Accident Management
- Risk Management.

2 THE SAFETY INSPECTIONS MANAGEMENT SYSTEM, SIM

2.1 A bit of history

The General Safety Group is in charge of the survey of all safety aspects of the CERN infrastructure and personnel workplaces. The group carries out safety inspections and accident analysis on the CERN domain. More specifically, safety inspections are carried out on buildings, equipment and installations.

For years, the safety inspectors have been storing the results of their inspections into a system called DSI, Database for Safety Inspections. This system is used to generate and print out copies of inspection reports, which are then sent to the concerned persons by internal mail. Each inspection report consists of a purpose, some comments and a conclusion, plus some remarks that are focused on specific problems found and/or give recommendations. These remarks have to be treated by the recipients of the report.

There are different types of inspections, for the various types of objects: reception, periodical, inquiry, on request, fire protection, etc…

The purpose of the process is to ensure that all necessary actions (preventive or corrective) are followed-up.

The current actors are SC/GS inspectors, DSOs, TSOs. At the present time, the TSOs are not only involved at the buildings level, but often appear also as contact persons for the equipment and installation inspections instead of the equipment supervisor. This is due to the fact that, for example in experimental areas, equipment supervisors are not always well identified.

The DSI system is built upon FileMakerPro and runs on a MacIntosh server. The used version of FileMakerPro is obsolete and no longer supported. Limitations on access control, limited space available for data, difficulties to integrate new functions and operational problems lead to the decision of replacing DSI.

A new system has been developed by TS/CSE within the MTF-EDMS/D7i framework: the SIM (Safety Inspections Management) system that will be put into production before the summer 2005. This new system will progressively replace DSI. At the end of the last year, SIM was presented to a group of pilot users [2] who participate in a pilot run [4], after having been trained [3].

A plan for the SIM production start-up [5] has been elaborated in collaboration with the SC which includes:

- Results of meetings and discussions held with the equipment “owning” groups and the MTF and D7i support teams during the last months to prepare the introduction of SIM.
- The impact of the new system on the procedures for operation and maintenance of equipment and installations that are subject to inspections from SC and how D7i is used by the concerned equipment groups.
- Implementation proposals defined in collaboration with the MTF and D7i support teams to solve the different conflicts encountered by the users’ requirements and constraints of the MTF-EDMS/D7i framework.
- Roles and responsibilities of the different groups concerned in the entire process.
- The plans for the SIM pilot tests, the migration of current SC/GS data into the CERN GMAO system (Gestion Maintenance Assistée par Ordinateur) and the production of the new SIM system.
- The experience acquired and open issues.

2.2 Additional objectives

In addition to the general objectives presented in Section 1, the following requirements were also expressed by SC:

- Data should be structured, and a hierarchical representation of installations and equipment is required
- Equipment & installation data from CERN equipment D7i db covering whole life-cycle and commonly used by the operation and maintenance managers
- Inspections information available to everybody concerned
- Clear definition of roles and responsibilities and implementation within the system of the required procedures
- Complete traceability of actions (who, what, when)
- Management of the follow-up of the remarks and recommendations reported by the inspectors.

2.3 Requirements and constraints

Safety inspections are performed on buildings, equipment and installations. The new SIM system shall allow the registration of safety inspections only on objects registered in the D7i CERN Equipment database (supported by TS/CSE).

During the specification [6] and development of the system certain requirements were identified as having an impact on the activities of the equipment "owning" groups. For those requirements actions have been taken or will be taken before the production starts:

- All equipment at CERN (at least the ones inspected) must be uniquely identified and marked. All existing SC equipment identifiers have to be migrated from the database currently used by SC/GS to the CERN Equipment database. To be noted that:
  - SC/GS has been registering equipment and installations for which inspections are done or should be done in their database. Inspected equipment has been engraved with an SC/GS identifier at the time of reception on site.
  - The SC code engraved on the equipment is the only way today to physically identify the equipment.
  - The equipment naming convention used by SC/GS is different from the one used by the equipment groups. Equipment groups do not (yet) have a common equipment convention.
- The equipment's safety attributes (as defined by SC) and the data of the last inspection of each type for both equipment and installations shall be migrated from the SC/GS database to the D7i system before the SIM production startup. The effort required in this migration process is:
  - The homogenization of equipment classes with SC and among the equipment groups. The Annex A presents the D7i equipment classes inspected by SC.
  - The identification of equipment and installations and data differences.
- Traceability of the equipment and installations inspected shall be assured. The complete inspection history for each object shall always be available.
- In order to ensure the complete traceability of the equipment inspected it is necessary that the equipment is defined in the D7i as an equipment (asset) and not as a functional position as it is normally the case for TS equipment (from former ST).
  - The impact of the changes has been studied with the equipment groups, procedures have been defined (equipment naming convention, migration to SIM) and their implementation in D7i prepared.
  - In addition, a procedure for the 'The Reception and Commissioning of Equipment and Installations' is being prepared by the TS/CSE group [R7], which covers issues related to quality assurance, data quality and safety activities. TS/CSE has the responsibility to maintain the LHC QAP within the LHC QAP WG mandate. An extension to a CERN-wide QAP is planned.
- Clear definitions of roles and responsibilities. The safety inspections reports are addressed to the person responsible for the concerned inspected object who should ensure that the remarks and problems encountered by the inspectors are resolved/followed. The responsible persons are identified as follows:
  - TSO for buildings.
  - Technical responsible or the Operation & Maintenance manager for equipment and installations. This information does not always exist in the D7i ('détenteur'). Therefore, for all objects subject to inspection by SC it is mandatory to identify

and assign in D7i an ‘equipment supervisor’. This has been discussed with the equipment groups who all agree that; in general one person will be assigned for each equipment class or maintenance team. The name of the person responsible will be registered in D7i during the migration of the equipment data from the SC/GS database and before the SIM production starts. If exceptionally no equipment/installation supervisor can be found, the TSO will be automatically registered as being the responsible person. For installations, the name in the field ‘responsible person’ defined in the SC/GS database will be used.

2.4 Implementation solution

2.4.1 MTF/D7i-EDMS framework

The MTF application is an integral part of CERN’s EDMS (Engineering Data Management System) that was developed to capture manufacturing and installation data of equipment built for LHC. The new system SIM has been built within the MTF but currently it is not ‘linked’ to the LHC Equipment database but to the CERN Equipment technical infrastructure database (GMAOTECH). In the future, the LHC equipment shall be visible from SIM as well. Then SIM will provide a complete view of the operations done on any inspected object at CERN.

Access to the SIM system is given by the EDMS login/password mechanism. Safety inspection reports are visible to all the EDMS users. Only inspectors can create them.

Table 1 SIM implementation solution within the MTF-D7i/EDMS framework

Inspections’ element	**Mapped to MTF/D7i-EDMS element**	**Constraints, considerations**
Inspection	Step / Job	‘Safety Inspection’ D7i job type
Inspection Report	EDMS document (type Safety Inspection)	Attached to the Inspection. The Inspection report in its printable format is a html file put in this EDMS document and generated dynamically when accessing it
Remarks of an Inspection Report	Sub-documents of the Inspection document (type Safety Inspection Remark)	To be created as sub-document of the corresponding Inspection Document to assure consistency and that the whole functionality available is provided
Inspection Report Distribution and ‘Resolution of Remarks’ processes	EDMS release procedure and approval process	Possible to adjust the pre-defined distribution lists Comments can be given on both Inspection Report and all its associated remarks
Notification mechanism	EDMS notification	Executed periodically (monthly, annual reports) or according to defined conditions (reports not closed within defined delay, …)
Custom reports	On request	
Inspections associated to an object (equipment and buildings)	Operation jobs in MTF	All the interventions done on the object are provided: operation & maintenance, safety inspections

All the inspectors have the same access rights on all the inspections, independent of the concerned object, *i.e.* creation, modification, signature and distribution, validation and closure. This also means that any inspector has the ability to work on a report created by another inspector.

This strategy has been chosen in order to assure a light administration of access rights and data transparency for the users. It is to be noted that all the actions are in any case registered by the system (who, when, what). A more restricted policy could be set up if the experience after some months of operation shows it is required.

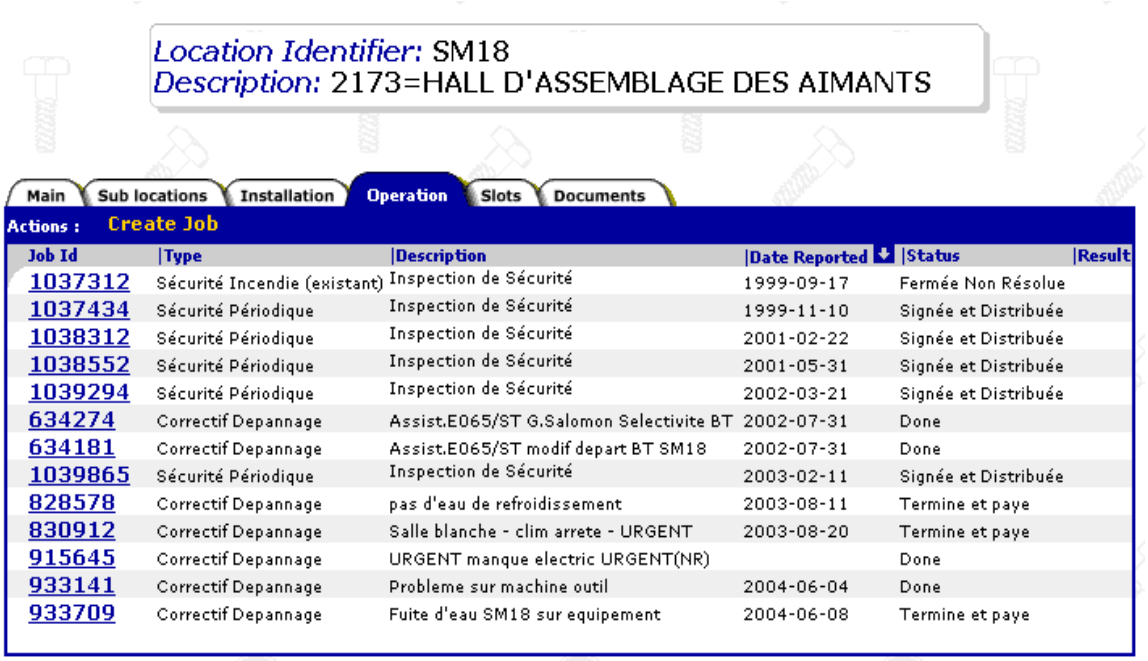
The roles and responsibilities are defined according to the requirements presented in 2.3 as follows:

- Inspectors create and manage inspection reports and their remarks.
- Remarks resolution responsible persons are defined depending on the inspected object: TSO for buildings and equipment supervisors for equipment and installations.
- SC and the management of the departments "owning" the inspected objects prepare statistics and define plans.

Annex B presents the safety inspection management workflow with the roles and responsibilities and main data elements involved. Annex C shows the inspection report and remark (documents) life-cycles.

An MTF-EDMS pilot environment dedicated exclusively to tests and pilot projects has been provided. This environment is given to the users for testing and validation before any new functionality is put into production. For the moment, this pilot environment is only being used by the groups SC/GS (SIM project) and by a group in AB.

Figures 2 AND 3 show some images of the SIM system.



Job Id	Type	Description	Date Reported	Status	Result
1037312	Sécurité Incendie (existant)	Inspection de Sécurité	1999-09-17	Fermée Non Résolue	
1037434	Sécurité Périodique	Inspection de Sécurité	1999-11-10	Signée et Distribuée	
1038312	Sécurité Périodique	Inspection de Sécurité	2001-02-22	Signée et Distribuée	
1038552	Sécurité Périodique	Inspection de Sécurité	2001-05-31	Signée et Distribuée	
1039294	Sécurité Périodique	Inspection de Sécurité	2002-03-21	Signée et Distribuée	
634274	Correctif Depannage	Assist.E065/ST G.Salomon Selectivite BT	2002-07-31	Done	
634181	Correctif Depannage	Assist.E065/ST modif depart BT SM18	2002-07-31	Done	
1039865	Sécurité Périodique	Inspection de Sécurité	2003-02-11	Signée et Distribuée	
828578	Correctif Depannage	pas d'eau de refroidissement	2003-08-11	Termine et paye	
830912	Correctif Depannage	Salle blanche - clim arrete - URGENT	2003-08-20	Termine et paye	
915645	Correctif Depannage	URGENT manque electric URGENT(NR)		Done	
933141	Correctif Depannage	Probleme sur machine outil	2004-06-04	Done	
933709	Correctif Depannage	Fuite d'eau SM18 sur equipement	2004-06-08	Termine et paye	

Figure 1 – List of interventions (safety inspections, operation and maintenance) in building SM18

Inspections made since

May 04 Jun 04 Jul 04 Aug 04 Sep 04 Oct 04 Nov 04 Dec 04 Jan Feb Mar Apr **May**

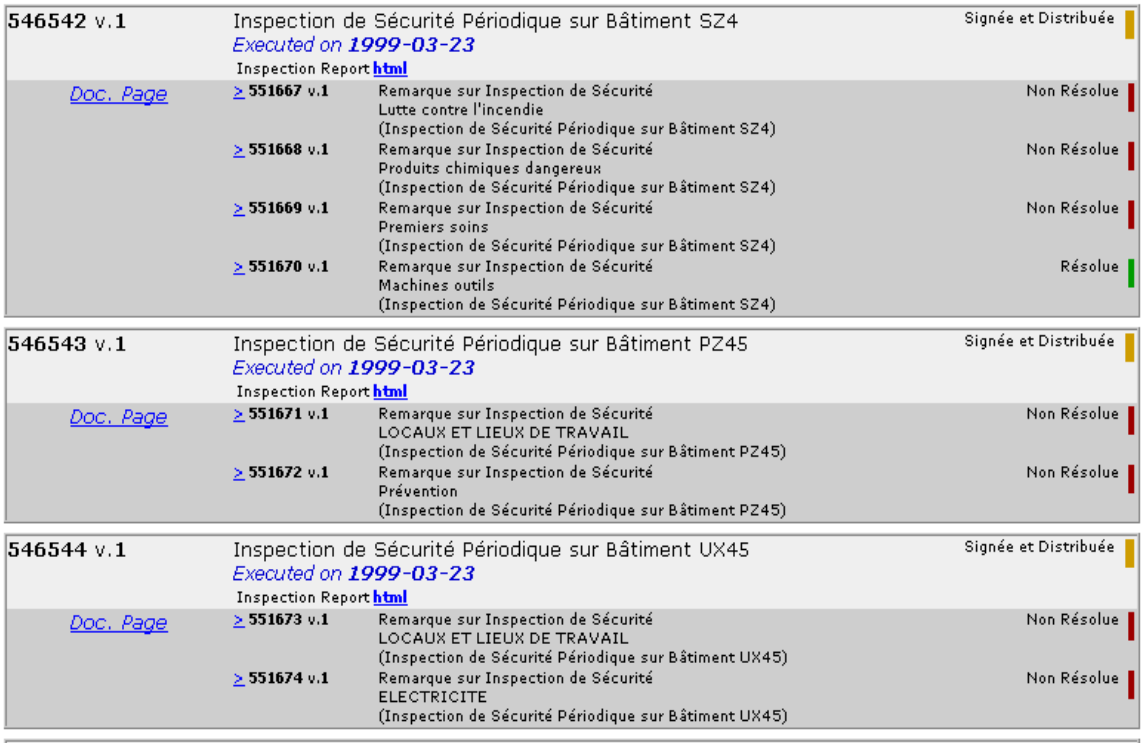


Figure 2 – Example of inspection reports (EDMS documents) with their associated remarks (subdocuments)

SAFETY COMMISSION (SC) *COMMISSION DE SECURITE*

Safety Commission

GENERAL SAFETY GROUP

Référence: EDMS 568184 v.1 — *Date: 2005-09-29*

Inspection de Sécurité Périodique sur CR000000000004 (ASCENSEURS AS-0008)

Site: MEYR
Localisation: 252

Description: MONTE CHARGE SAARBRUCKER 1,5T

Date visite: 2005-09-29
Exécutée par: LAURENT COLLY

Valable jusqu'à: 2006-09-29

A: OLIVER BOETTCHER
De: LAURENT COLLY

TSO: OLIVER ABERLE
DSO: PAOLO CENNINI

Distribué à:

But de l'inspection:
L'appareil indiqué, dans la mesure où il était accessible, a été vérifié suivant le code de sécurité D1 en vigueur sur les sites du CERN pour les appareils de levage.

Commentaire:
Le présent rapport ne concerne pas la vérification de l'état de conformité aux exigences relatives à la conception. Les observations éventuelles sont classées suivant les degrés d'urgence suivants: I = action immédiate, S = disposition déterminante pour la sécurité, R = recommandation

Points vérifiés:

[0] Cabine
[0] Essais de fonctionnement
[0] Machine et local de machine
[0] Portes palières
[0] Sans observation
[0] Dispositifs de sécurité
[0] Gaine
[0] Organes de suspente
[0] Prescriptions diverses
[3] Ascenceur

Conclusion: L'équipement peut être maintenu en service, toutefois il convient de tenir compte des observations.

568185 - Remarque - Ascenceur - Portes palières
(Inspection Périodique CR000000000004 (ASCENSEURS AS-0008))
Régler la verticalité des vantaux des portes palières.

568186 - Remarque - Ascenceur - Cabine
(Inspection Périodique CR000000000004 (ASCENSEURS AS-0008))
Rendre efficace et régler le dispositif de protection sensible des

portes de la cabine pour un effort maxi de 150 N.

568187 - Remarque - Ascenceur - Cabine
(Inspection Périodique CR000000000004 (ASCENSEURS AS-0008))
Reafficher la capacite de charge et le nombre de personnes

Figure 3 – Example of a report for a periodical safety inspection for SZ4 in 1999.

2.4.2 Migration of SC/GS db equipment data into SIM

The equipment classes defined in the SC/GS database have been compared with the D7i object classes. Fortunately, the mapping (Annex A) is mostly one-to-one except for a few cases where conflicts haven been resolved.

In a first step, safety attributes of each SC equipment class have been created and associated to the respective D7i class.

In a second step, for each equipment class, the SC equipment descriptions have to be mapped into existing D7i objects (equipment, functional position). This is done by SC/GS in collaboration with the D7i support team and the equipment groups concerned and performed progressively; further actions are taken depending on the results from the comparisons. The actual D7i configuration has been defined and data to be migrated are available [8].

The existing SC/GS objects are migrated /created into/in D7i as follows:

- equipment -> equipment (asset): a new equipment will be created if it does not exist already as such and in the case a mapping functional position was found, it will be attached to it (concerns only TS equipment)
- installation -> system

The total number of equipment registered in the SC/GS DSI db to be migrated is 31000. For around 25% (8300) the migration has been straight forward (mapping object existed in D7i); around

30% of the DSI equipment belong to classes under study (10200 safety valves, 1800 reservoirs); and finally, for those equipment for which it has not been possible to find in D7i a 'mapping' object, a new equipment will be created before production based on DSI data; these equipment data will be maintained by SC/GS.

The data regarding the last inspections for equipment and buildings available in DSI have also to be migrated. A test migration has been performed on a pilot environment. Around 4600 reports and around 13000 remarks have been migrated into the SIM pilot and attached the corresponding previously migrated equipment (8300). The total number of inspection reports currently register in DSI database is:

- 4317 building reports, associated to 1406 buildings (339 not longer valid).
- 38616 equipment reports, associated to 31000 equipment.
- 1412 installation reports, associated to 832 installations

This migration was requested by SC not only to keep the history but also because each periodic inspection report is strongly related on the previous one. This equipment and inspection reports migration requires an important effort from all the groups involved in the collaboration (SC/GS, TS/CSE SIM team, equipment supervisors, D7i support and EDMS/MTF support).

2.4.3 Equipment naming convention and identification

The equipment created during the migration process will be given identifiers following the CERN Equipment Identification [9] for CERN multi-purpose material:

Equipment Identifier= CR<sequence number>

Equipment to be inspected by SC/GS shall be registered in the CERN D7i at the time of reception by the responsible engineer and using the above naming convention. The equipment safety attributes shall also be entered at the reception by the responsible equipment engineer with the support of the SC/GS where required. In the case the equipment group concerned does not use the CERN D7i system, the equipment responsible shall ask the D7i support to register it. SC/GS shall be given the grants to create/update D7i equipment and installations.

2.5 Production start-up plans

SC/GS inspectors and pilot users have been trained on the new system. A specific training is not foreseen for the moment for the other type of users although it is recommended to have followed an EDMS course or have experience with it. The SIM Users' Manual [10] will be available from the SIM system. Requests for support have to be addressed to the EDMS support at the following address: .EDMS.Support@cern.ch

The start-up production of the SIM system is foreseen before the summer 2005. The new system shall replace progressively the DSI application currently used by the SC/GS inspectors. During the months of February-May 2005, a pilot of the new system has been tested by representatives of the different types of future SIM users (SC/GS inspectors, TSOs and DSOs, equipment and installation supervisors) and their feedback is being processed and integrated in the production version progressively.

The SC/GS users are being trained in both EDMS and SIM usage. In addition, TS/CSE is participating with the users to make practical exercises consisting of inspection reports preparation in both the current FileMaker program and the new SIM tool comparing the results (reports contents and layout) and evaluating the operation (time required, difficulty, errors, and possible mistakes). These practical exercises are very constructive and allow not only to identify errors and possible improvements of the SIM but also to prepare efficiently the users to the near future operation of the new system. Up to now the users' feedback has been positive.

Information campaigns (and users training if requested) will be addressed to the other SIM users' communities (TSOs, DSOs, and equipment and installations supervisors) as soon as SC/GS validates the SIM product and we agree on a production start-up date.

The future users of the new system will be the SC/GS inspectors who are around 35 persons, the CERN TSOs and DSOs, the supervisors of inspected equipment who are around 20 persons and the installation supervisors (number not yet known).

In a first phase, the SIM shall allow the SC/GS inspectors to create and manage inspections on equipment and buildings. In a second phase, in September 2005, the inspections on installations, visits to personnel work posts and worksites (VIC of AOC) will be integrated.

Once the SC/GS inspectors start using the SIM application for a specific type of object, the use of DSI will be prohibited.

The safety inspection reports will be addressed to the person responsible for the concerned object for handling and resolution of the remarks and problems encountered by the inspectors, as follows:

- To the TSO for buildings
- To the technical responsible or operation & maintenance manager for equipment and installations.

2.6 Open issues

Remaining issues to be studied are:

- Migration into D7i of DSI equipment data with conflict or for which a 'mapped' object was not found.
- Study and define an "easy" use of SIM and D7i for the management and follow-up of interventions by equipment groups due to resolution of remarks of inspection reports.
- The need to specify the location more precisely by giving the office number has been expressed by SC/GS building inspectors. This is required in order to associate the remarks of buildings inspections to a specific position within the building. This need has also been expressed in other projects. To be studied how to implement this requirement within D7i support.
- Make users aware of the benefits using the SIM despite the extra initial effort required when starting to use a new tool, methods and terminology.
- Complete SIM training of the SC/GS inspectors. And in collaboration with SC/GS, inform of SIM production start-up to the future SIM users (not of SC/GS) like TSOs, DSOs and equipment supervisors. These information sessions will cover both the use of the SIM system to be presented by us and the safety related procedures and recommendations to be presented by the SC/GS inspectors.
- Complete processing of SC/GS users' tests reports and in collaboration with SC/GS, definition of priorities for the integration of improvements.
- Identify areas which could be improved with benefit for all the MTF-EDMS users.
- The role of SC is to ensure that the persons concerned by the safety inspections are aware of their roles and responsibilities and that the procedures defined are followed. The TS/CSE group's mandate is limited to the operation of the SIM's operation and to provide support to the users.

2.7 Benefits of the new system and lessons learned

The major benefits of the SIM system are that from now on, safety inspectors and equipment supervisors work on the same system and share the same data:

- One single source of data
- Safety inspections can be seen by the equipment supervisors
- Equipment maintenance operations can be seen by the CERN safety responsible persons.

Better equipment data quality thanks to a better definition of roles and responsibilities during the whole life cycle of the equipment.

The provided reporting tools will help the different users to better identify problems where urgent actions are required and give them a good view of the objects they are responsible for.

The requirements and constraints of the various groups involved are different and it is difficult to find a good compromise which satisfies all of them. Effort has been put, during the whole project, on ensuring that the wishes of each group have been taken into account. This has been very time and energy consuming, and the negotiations have not always been easy.

The effort required in the migration of DSI data into the SIM and D7i was underestimated. We were also optimistic in the effort (time, energy, psychology) required on our side to train the SC/GS inspectors and to make them participate in the tests. The processing of the tests reports provided by SC/GS is also a delicate task. Only with a close collaboration with our users and a good understanding we finally are managing to prepare them for the production start-up. We hope to achieve the validation of the product soon.

3 STATUS REPORT ON OTHER PROJECTS

3.1 Management and follow-up of radioactive sources with D7i

The SC/RP group uses an Oracle Forms application for managing the radioactive sources. The program is incomplete and obsolete (Forms are not longer supported by Oracle). The database is built on Oracle but there are not constraints defined at the database level or application level. Despite the data confidentiality required, the access control implemented is very poor.

The functionality currently provided is:

- Sources data management and control (location, user responsible)
- Sources distribution (authorizations, loan periods, inspections)
- Reports generation

A year ago, SC/RP contacted TS/CSE to have a complete re-engineered system. The new system should integrate the SC Quality Assurance procedures and existing data be migrated, provide a secure access control and consider several new users' requirements and improvements. Despite the lack of a users' specification, TS/CSE provided a first prototype within 4 months, in July 2004. The requestor found the interface not very friendly and the operation heavy and not adequate to the specific domain of activity. A second simplified prototype, with some customization (navigation, terminology) and configuration (sources attributes) to satisfy the requestor's requirements was provided a month later, in August 2004. The prototype was evaluated by the requestor and reviewed with the management of both parties. SC/RP appreciated the benefits of using a tool such as D7i (asset management and complete traceability of actions on the equipment, configuration, data security and access control facilities) and of the specific development done (loans integrated within the inspections management, custom reports) but did not accepted it. SC/RP was not ready to change their work methods and claimed that had no resources to cover the extra effort required to use D7i as proposed by TS/CSE (asset tracking and inspections management and follow-up).

It was decided that once MP5 would have been upgraded to D7i, this project be re-studied and the new D7i features evaluated (ex. Web base, custom reports construction by users) to check if SC/RP needs are covered. The re-study of this project is in the plan for this year.

3.2 Management of Accidents

3.2.1 Project launch

The project definition with SC concerned groups (GS, FB, ME, IE) started in March 2005. The purpose, scope and objectives are being defined. The applicable safety rules and codes, and related systems identified. Roles and responsibilities of each group are to be clearly defined together with the project organization, resources and plan.

Each group concerned by the project (GS, ME, FB, IE) has been asked to provide:

- The description of all the group activities and official responsibilities related to accidents and incidents
- Tools currently used
- Objectives and ideas to improve/change current procedures/methods (not directly related to the software tools currently used)

At this first stage of the analysis, interviews are being held with each group, regular project meetings with all the groups shall start soon. The objective is to have a validated users' specification by July 2005. Then, this specification will be studied with the TS/CSE MTF/EDMS development team and management to evaluate the feasibility of developing the system within the D7i-MTF/EDMS framework and estimate the development effort required. Based on the result of the feasibility study a project plan will be defined in collaboration with SC.

3.2.2 Firsts results of the analysis

The principles and objectives identified up to now are the following:

- A unique and shared declaration for each accident, but with a few 'authors' and actors.
- Actors from the different groups and services concerned must be well identified. Currently identified as possible direct actors are: FB personnel, ME service (doctors, nurses), SC/GS (inspectors, accidents supervisors), IE. Another type of actors, indirect, would be the persons injured and the GL(s) of the person(s) injured or works supervisor.
- Possible actions by each type of actor must be well defined. Actions shall be completely tracked by the system and a 'history' kept. All the 'direct actors' could have similar grants on the accident shared data but specific grants should be required on the specific accident data from each service and restricted to the directly concerned actors.
- Accidents data are confidential and shall be protected. Read access privilege could be defined via CERN HR official roles.
- Assure an efficient team-up of all the different groups and services concerned.
- An accident should be registered in the system by the first service that intervenes. All the concerned 'actors' would have the rights to create/modify (only under defined conditions) accident data and add additional information.
- Currently, each intervening service has their own system to register accidents and related information. It is to be studied which is the information from these services to be provided within the new system and how to interface to these systems.
- The accident data could consist of:
  - Identification data *(shared):* Identify uniquely an accident with the minimum required information to be entered at its registration and at its closure. For example, identifier, place, date & time, initial/final description and recommendations, persons injured, objects damaged, cause, etc.
  - Additional data from each intervening service, from accident registration to closure. For example: the ME service registers in a specific system (MEDSERV) for each

person injured the medical intervention reports and external medical certificates, the FB intervention reports in case of intervention for accident, the GS the inquiry report, HS50 document prepared by each person injured, Code A2 document prepared by the GL of the work supervisors in case the accident occurred in a worksite, etc.

3.2.3 Open issues and questions

The open issues identified up to now are the following:

- Use the definition of accident according to Code A2 and procedures followed by services intervening when an accident occurs to define: the shared common basic data and specific data, workflow, actors, access grants to accident data, all along its life-cycle and by every type of actor.
- Accidents registration and accidents closure conditions. The closure could be done by an accidents supervisor (SC/GS) but only when all intervening services closure is done. It is under study if the approval by all the intervening services would be required and which are the documents and information to be provided at the closure by each service.
- Definition of the accident information views. Only data defined as related to the accident shall be visible by the intervening services (i.e. medical report due to accident is visible but not other medical reports of the person injured). It is to be studied which view shall be provided to the persons affected or involved in the accident like the persons injured, witness, the work supervisors, the equipment supervisors, and the management.
- Preparation of the Code A2 and HS50 documents (currently in paper format, under development in EDH) and their interaction with the system.
  - To be studied is the need to control that these mandatory documents are created by the concerned persons and contain valid data. For example, currently, only when there is an inquiry, the SC/GS accidents supervisor and the inspector responsible of the enquiry could have the responsibility to check that the CODE A2 was created and contains valid data.
  - The Medical service receives from HR a paper copy of all the HS50 documents and checks the validity of number of leave days of the person injured due to the accident. They also check that for every HS50 received, the corresponding accident has been registered in the database and that for every accident registered, an HS50 exits.
  - The ideal would be that the Code A2 and HS50 documents are partially created from the Accidents database and associated to the accident by the person creating it.

The Annex D presents a global view (UML case study) of the accidents management process as defined from the analysis realized up to now.

3.3 Management of Risks

The project is being defined by SC in terms of purpose, scope and objectives, and it will be completely defined in collaboration with us in the following months.

A new database is to be entirely developed. Different risks types are defined according to different criteria and identified/associated to a specific level of location, from buildings to offices or any other location type. Risks are also defined associated to specific equipment and operational modes. It is not evident to define the right granularity; in this choice, the effort to keep up to date the data will be taken into account against the fact of providing not detailed enough information. First discussions were held with the responsible of the CERN patrimony database with the aim of identifying at which level of location the risk could be defined. Within the frame of the EDH-AOC project (2003), the asbestos and chemical risks associated to a building were integrated in such database.

The main users of this Risks database will be the Safety Commission, who will have the mandate of providing and keeping the data up to date. The risks database will however be useful and sometime even required for many different CERN groups. The safety risks associated to locations are an important issue to be considered not only when defining the inspections general plan but to inform users of the conditions of the locations of installations/works in order to prevent accidents and assure personnel safety. If a database to manage and follow-up risks associated to locations would exist, the effort to ensure personnel safety on the site would be less and the results would be better.

The SC/GS team is in charge of executing safety inspections on the CERN buildings and equipment and installations. Risks are normally identified during the regular inspections, also due to accidents. The purpose of the Risks database for SC/GS is to identify those locations with risk(s) in order to take the corrective and preventive measures to reduce accidents to a minimum and assure safety conditions. And last but not least, to identify the risks to which a person is subjected and which specific safety training should be followed.

4 CONCLUSION

The experience has been positive and rich in events. The effort made and effective team work starts now to give results. This collaboration is interesting for our group, with benefits for the CERN-wide community. With the new SIM system we have made a big step forward in the safety and follow-up of equipment by having safety inspectors and equipment supervisors working on the same system and sharing the same data.

The LHC machine remains the highest priority for the TS/CSE group. The ongoing studies will be carried out and depending on the feasibility analysis and available resources (in SC and TS/CSE), we will proceed or not with their implementation.

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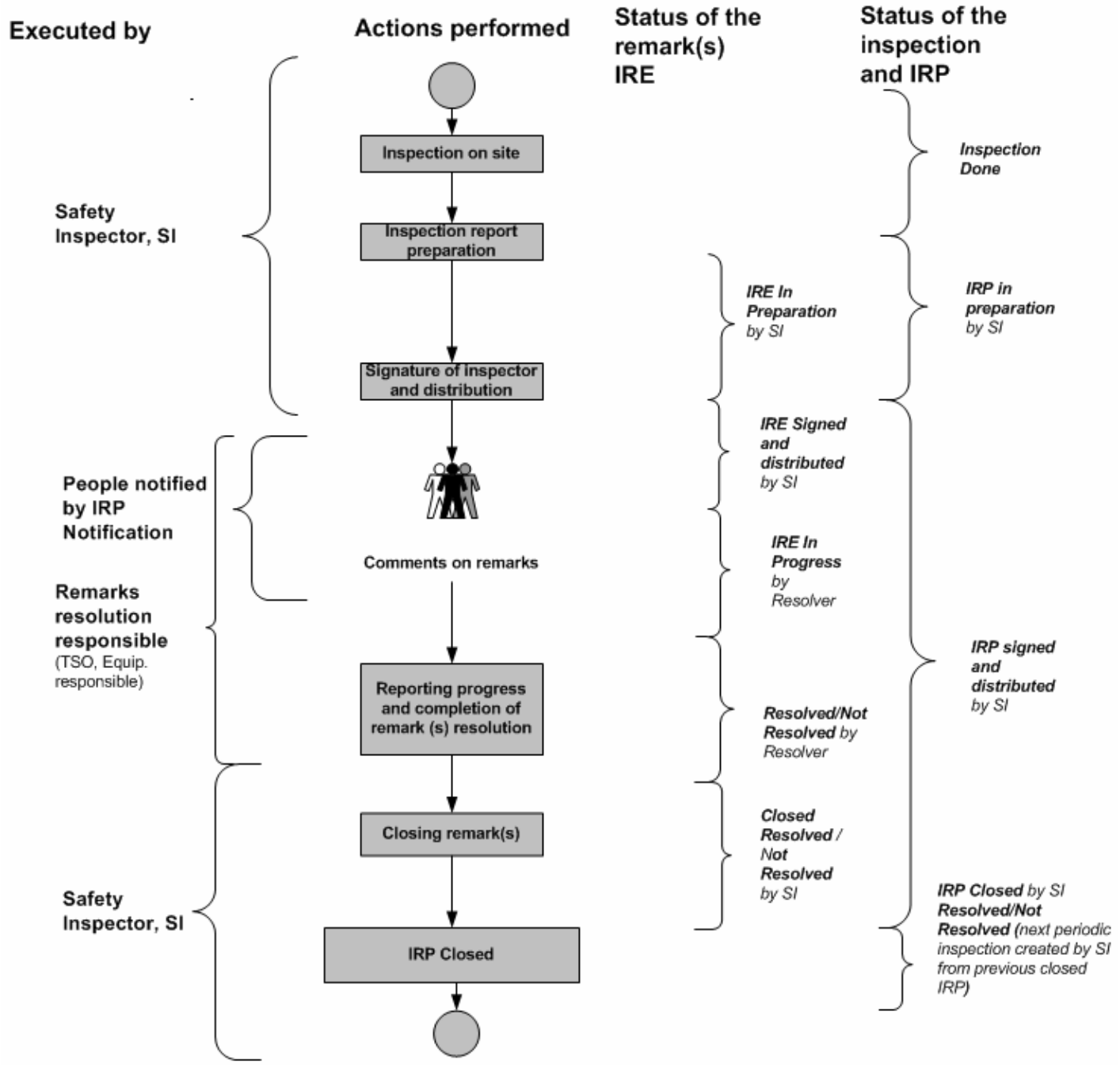
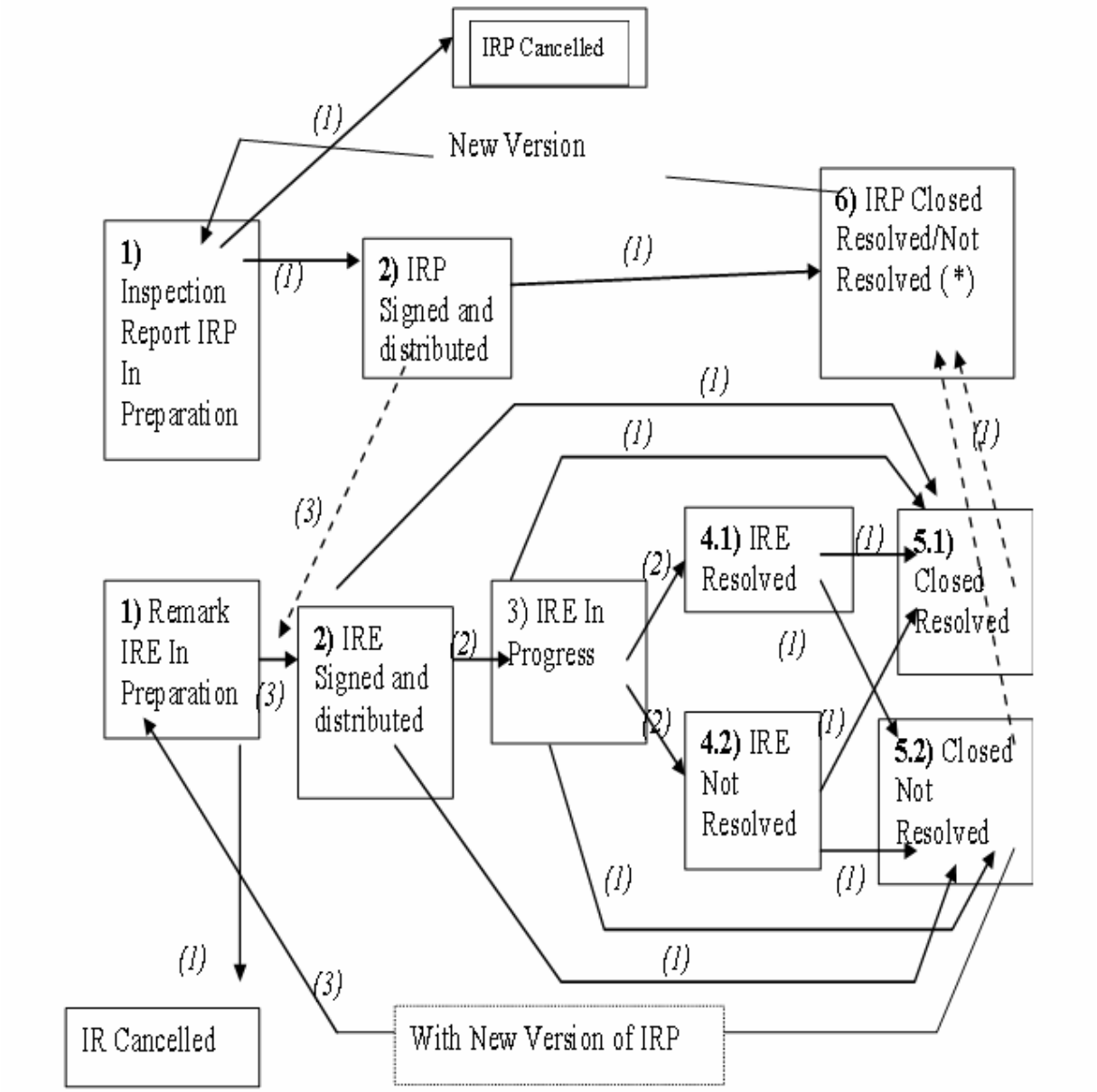
ANNEX A - OVERVIEW OF EQUIPMENT CLASSES INSPECTED BY SC/GS

SC Equipment class	**Number of SC Equipment**	**% SC Equip found in D7i**	**Technical groups responsible**	**D7i Equipment Class**
Ascenseurs /AS	112	93	TS-IC, TS/FM	HAS
Chariots /CH	527	74	TS-IC	HCH
Elévateurs /LV	149	74	TS-IC, TS/FM	HLV
Elingue /eA, eB, …	9525	0	TS-IC, SC/GS	PELI *(5)*
Lignes a pression /LP	144	0	TS-IC, SC/GS	PLIG *(5)*
Supports Mobiles /SM	29	-	TS-IC, SC/GS	Not used
Train Monorail /TMC	118	68	TS-IC	HMW
Palans/PA	1186	92	TS-IC, TS/FM	HPA
Palonniers /R	2092	96	TS-IC, TS/FM	HR
Pont roulants/PR	397	98	TS-IC	HPR
Portes/PO	376	76	TS-IC (underground), TS-FM (surface)	HPO
Réservoirs a pression /RP	1673	Under study	TS-CV, TS-FM, AT-ACR & ECR	FRES (*réservoir*) *(1)*
Soupapes de sécurité /PSV	10248	3 Under study	TS-CV, TS-FM, AT-ACR & ECR	FVAN, F$F /VV (*vanes*) *(3)*
Transpalettes /TP	581	75	TS-IC	HTP
Machine tools/M<nn>	1445	100	TS-MME	HX<nn>

ANNEX B - SAFETY INSPECTIONS MANAGEMENT WORKFLOW



ANNEX C - SAFETY INSPECTIONS REPORTS AND REMARKS LIFE-CYCLES



Roles	*Abbreviations:*
(1)Inspector	IRP: Inspection Report
(2) Remarks resolver	IRE: Inspection Remark of an IRP
(3) System	

ANNEX D - MANAGEMENT OF ACCIDENTS GLOBAL VIEW – FUNCTIONAL DIAGRAM (UML CASE STUDY)