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**THE FIRST YEAR OF THE ST OPERATION COMMITTEE
IS THERE A FUTURE ?**

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Abstract

The main objective of the ST Operation Committee (STOC) was to develop a proactive and homogeneous service of operation that satisfies the needs of the service users. Furthermore, the role of the Technical Control Room (TCR) should have been developed to a unique and competent entry point for ST operation by bringing the operation teams closer together on a daily basis. Have these objectives been achieved and to what extent? Is there a future for this committee and what could it look like? What are the implications of the first year of work on ST operation as a whole? This paper answers these questions and gives recommendations how to make best use of the STOC for the ST partners and ST, respectively.

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1 INTRODUCTION

The ST Operation Committee (STOC) has been created at the beginning of 2003 as a divisional tool for ST operation. The permanent members of the STOC are the leaders of the operation teams, the maintenance managers, a shift leader of the Technical Control Room (TCR) and the group leaders of ST/EL, ST/CV and ST/MA. The STOC objectives have been defined as:

- To develop ST operation into a proactive and homogenous service that ST partners can refer to and that satisfies their needs
- To bring the operation teams closer together on a daily basis
- To prepare TCR as a competent and unique entry point to ST operation
- To increase the visibility and valorisation of operation

In the nuclear industry operation is defined as all the activities performed to achieve, in a safe manner, the purpose for which the plant was constructed, including maintenance, refuelling, in-service inspection and other associated activities [1]. The work of the STOC seemed to fit well into this context resulting in the following mandate:

- Co-ordination of planned interventions, such as tests, preventive maintenance and works impacting on operation, above all to identify and avoid collisions in schedules before problems in the field occur.
- Analyse events, tests, faults and breakdowns and establish a reliable and consistent internal and external reporting. This shall result in proposals and implementation of measures that proactively improve reliability, availability and accelerate the recovery after breakdowns.
- Evaluate the overall impact of specific operating conditions and adaptations to special user requirements
- Assure that installations being correctly transferred from projects to operation by the TCR.

The STOC activities of 2002 will be illustrated with examples and proposals will be made to evolve the work of the committee in the future.

2 STOC ACTIVITIES 2002

2.1 Events

The major part of the STOC activities concerned the analysis and follow-up (proactive measures) of faults, breakdowns and alarms and the co-ordination between the operation teams, especially with the TCR. Over 200 of those items have been analysed and solved in 2002 of which the distribution per group is shown in Table 1 below:

Group	Items closed	Average time to solution
CV	50	5 weeks
EL	46	2 weeks
MA	42	4 weeks
FM	18	3 weeks
CE	4	3 weeks

Table 1 Number of treated events and average to solution

The major part of those concerned ST/EL, ST/CV and ST/MA (covering access and safety, alarms systems, TCR operation and TCR monitoring). The average time to resolution was 2 to 5 weeks, with a maximum of 20 weeks. However, these numbers are lower than before the start of the work of the STOC, when problems have not been brought up at all or were not subject to a consequent follow-up and co-ordination.

Thirty-four Major Events have been documented and analysed and led to various improvements in systems and operational modes throughout the ST operation teams and the TCR. One example is a general power cut of the 400kV distribution on the 6th September 2002. As a consequence the PS and the SPS were stopped for 13 hours and the LINAC and the BOOSTER for 6 hours. This long interruption of service was due to malfunctions in the auto transfer system, the IT computing network, TCR operation, process functionality of CV equipment and broken hardware in the access system. Improvements for each of these systems have been identified and implemented. For most of these changes the impact has been validated during other power cuts or during tests that are similar to a power cut.

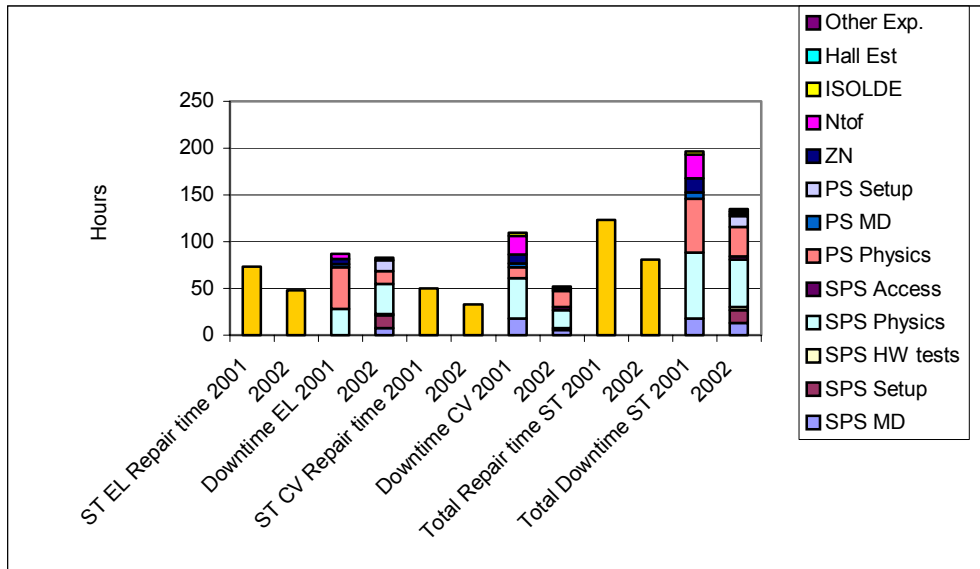


Figure 1 Impact of infrastructure faults on physics during the accelerator run 2002

Figure 1 shows the impact of faults in the ST infrastructure on the accelerator run [2]. The ST repair time in 2002 was reduced by 34% in comparison with 2001 and the impact on physics by 31%. The power cut of the 6th September represents about 10% of the total downtime.

Another example for proactive measures is the annual tests of the auto transfer system and the electrical safety network. The necessary changes identified after the tests in 2001/2002 have been implemented and were validated during the tests in 2002/2003.

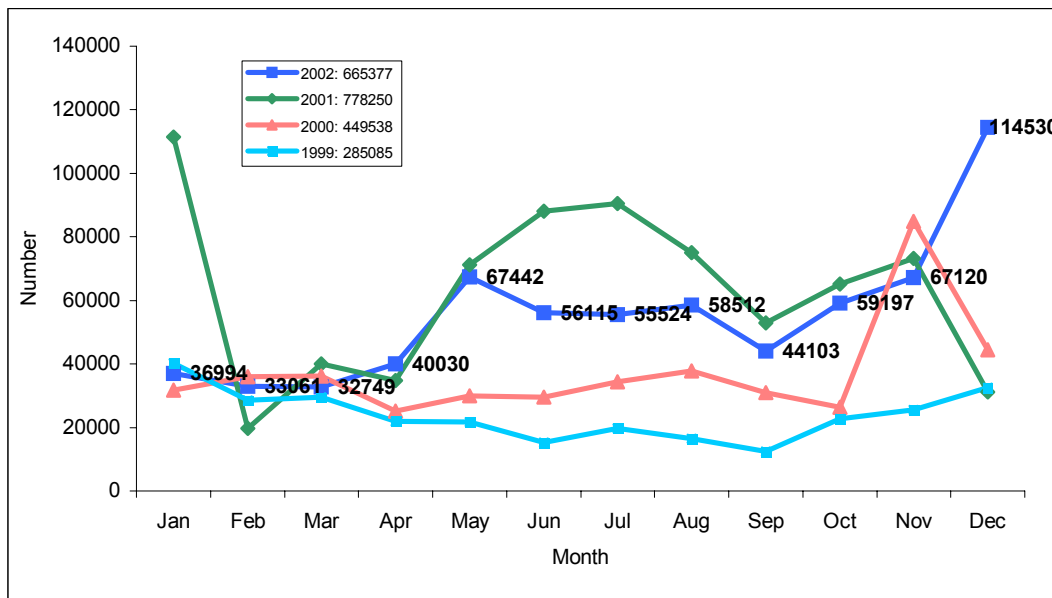


Figure 2 Comparison of TCR alarm transmission 1999 to 2002

2.2 TCR Operation

TCR operation instructions, modes of functioning and alarms have constantly been discussed and improved. The motivation of the TCR operators to raise problem areas and trigger an improvement processes increased considerably as solutions were implemented fast. One measure of the impact of STOC work is the number of alarms transmitted to the TCR. With 660.000 alarms in 2002 two operators on shift are still at the very limited of what can be handled in a reliable way see Figure 2. However, it is a reduction of over 14% with respect to 2001, which indicates that the efforts improve the situation but still have to be continued for several years, before a reasonable number of 50.000 to 100.000 alarms per year can be reached.

3 THE FUTURE

The STOC was a functioning tool of operation in 2002. This horizontal organisation of operation in the division has a future. Achievements have been made, however, progress needs to be made in the following areas:

- Communication channels need still to be improved: internal and external of the division. This will lead to a more efficiency and to a reduction of the average time to solution especially for the items that cannot be solved directly by the operation teams in the different groups, see chapter 3.1, 3.2.
- Based on the 2002 experience operation in the context of the STOC shall cover the following area to refocus activities in 2003:
 - Equipment in service
 - Equipment working within design parameters
 - Activities as a fast response to an indicator (alarm) that the equipment left its nominal parameters
- Co-ordination of planned interventions was improved in an informal way by circulating information during the weekly meetings and by extensive use of the “Note de Coupure”. IS37 and the “Avis d’Ouverture de Chantier (AOC)” shall also systematically be considered.
- The transfer of equipment from a project state into operation and TCR monitoring needs to be formalised.

3.1 Internal Communication Channels

In 2002, many items have been treated that could have been transformed in a project in an early stage in order to accelerate the solution, e.g. problems concerning monitoring and controls. In general, changes to equipment in service that exceed the competence and the resources of the STOC and the operation teams shall be handled in the frame of a project. The STOC shall identify and report these items directly to the Group Leaders Meeting (GLM). The GLM can then decide on priorities, budget and manpower allocation taking into consideration the global situation of the division.

Control and monitoring issues that need redesign or fundamental changes to the control or monitoring system shall be handed to the ST Controls Working Group. These experts shall seek an overall solution on a divisional level, or can achieve a specific implementation, based on a broader expertise. The ST Controls Working Group shall report to the STOC on the progress of implementation and hand the system back to operation once the solution has been validated.

Feedback and recommendations concerning maintenance shall be given to the Maintenance Managers, in particular concerning the experience from operation that could lead to global change of divisional maintenance.

3.2 External Communication Channels

The main user of the ST operation services is the AB division. Communication channels above all have been established in the direction from the ST division to the AB division. Establishing bidirectional communication channels could increase efficiency of operation and adaptation to the user needs. The comparison between different committees in the ST and the AB division shows that

corresponding committees and entities exist in both divisions (ATC – STTC, ABOC – STOC, MCR/PCR - TCR). A reinforcement of communication especially between the ABOC, MCR, PCR on one side and the STOC and the TCR on the other side would be beneficial.

ST operation and TCR monitoring depend to a wide extent on the network services provided by IT. Due to several breakdowns of these IT services, a member of the IT network group was regularly participating in the STOC meetings, which lead to a closer co-ordination between the two divisions. Within a certain limit the STOC shall invite non-ST participants, although it has been conceived as a ST internal tool.

3.3 TCR

The preparation of the TCR as a single entry point to the ST operation has not yet been fully achieved. Today, the technical infrastructure is monitored in the TCR and corrective actions are taken and executed by the TCR operator or transmitted to the competent CERN service or mandated contractor. However, traditionally information is directly exchanged between the users and the ST operation teams. Consequently the TCR is not always aware of all the arrangements, changes and on-going activities, which is especially an obstacle for the management of major breakdowns.

To implement efficiently the principles of the “Gestion Technique Pannes Majeures” (GTPM) [3,4] the TCR needs to be able to manage all elements of recovery and co-ordination of the intervening parties must be centralised in the TCR. As a breakdown occurs without warning, there is no time for preparation and thus also during normal operation the TCR needs to have a global picture of status of the technical infrastructure.

4 CONCLUSION

The ST Operation Committee as a new ST structure helped to evolve ST operation into a service where the users of the technical infrastructure can find proactive and homogeneous answers to their operational needs. Within the first year of existence the STOC became a functioning tool of ST operation. The collaboration between the operation teams located in separate groups has considerably improved. Confidence between the permanent STOC members has been established so that people help each other to solve problems irrespective the group affiliation. The STOC had not only a positive impact on the image of ST operation but also improved the motivation of the TCR operators to initiate improvements, due to the responsiveness of the STOC.

To preserve efficiency the work of the STOC must be refocused on a well-delimited field of operation. Specialised activities shall be transferred to the experts such as the ST Controls Working Group and the Maintenance Managers. Wide ranging and complex changes to the infrastructure in service shall be transformed in projects, rather than being implemented in an informal way. In addition communication channels outside the division shall be made bidirectional, in taking advantage of the corresponding committees on the user side and on the side of the service providers on which ST depends.

5 REFERENCES

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