Workshop on Machine availability and dependability for post LS1 LHC

Report of Contributions

Contribution ID: 0

Type: **not specified**

Introduction and motivation

Contribution ID: **1**

Type: **not specified**

Motivation and goals of Workshop

Thursday 28 November 2013 08:40 (10 minutes)

Presenter: Dr TODD, Benjamin (CERN)

Session Classification: INTRODUCTION

Contribution ID: **2**   Type: **not specified**

Dependability calculations prior to 2008 and operational experience during first LHC run

Thursday 28 November 2013 08:50 (25 minutes)

This presentation recalls the initial work done by the Reliability Working Group to assess the safety of the LHC machine protection system before its first operation. This study also provided numbers of machine availability for the systems studied. The initial estimate is compared with the LHC fault statistics presented at the different workshops across all systems. The importance of such studies and the role of the Availability Working Group for operation after LS1 are described.

Presenter: Dr UYTHOVEN, Jan (CERN)

Session Classification: INTRODUCTION

Contribution ID: **3**   Type: **not specified**

Cryogenics

Thursday 28 November 2013 09:15 (30 minutes)

The LHC accelerator being based on superconducting devices, the availability of it's cryogenic system is crucial for it's global performance. From the beginning, monitoring our availability has been part of our standard practices, allowing for continuous progress. After briefly describing pre-LS1 facts and tools, we will describe what is being done during LS1 in perspective of restart conditions and performance post-LS1. We will present a specific focus on rotating machinery and logging methodology.

Presenters: DURET, Eric Jean-Francois (CERN); Mr CLAUDET, Serge (CERN)

Session Classification: ONGOING IMPROVEMENTS FOR INCREASING THE AVAILABILITY FOR THE LHC

Contribution ID: **4** Type: **not specified**

LHC Beam dumping system

Thursday 28 November 2013 10:30 (30 minutes)

Presenter: FILIPPINI, Roberto (Unknown)

Session Classification: ONGOING IMPROVEMENTS FOR INCREASING THE AVAILABILITY FOR THE LHC

Contribution ID: **5**
Type: **not specified**

Magnet protection and interlocks

Thursday 28 November 2013 11:00 (30 minutes)

Presenter: GABOURIN, Stephane (CERN)

Session Classification: ONGOING IMPROVEMENTS FOR INCREASING THE AVAILABILITY FOR THE LHC

Contribution ID: **6**   Type: **not specified**

Availability of LHC Beam Instrumentation Systems

Thursday 28 November 2013 11:30 (30 minutes)

The presentation will follow-up from the MPP Workshop in Annecy and cover reliability issues for BI systems at the LHC. Emphasis will be put on the interlocked systems (BLMs and SR6 BPMs) which have a direct impact on the beam permits while a general overview for other critical systems with lessons learn during LHC run #1 will be given.

Presenter: Mr JENSEN, Lars (CERN)

Session Classification: ONGOING IMPROVEMENTS FOR INCREASING THE AVAILABILITY FOR THE LHC

Contribution ID: **7**   Type: **not specified**

Ongoing today: Cryogenics (no spare compressors for the future, what will be the effect on downtime, prediction/approach to preventive maintenance⋯)

Presenter: DURET, Eric Jean-Francois (CERN)

Contribution ID: **8**   Type: **not specified**

RF/Damper

Thursday 28 November 2013 12:00 (30 minutes)

Presenter: MAESEN, Pierre (CERN)

Session Classification: ONGOING IMPROVEMENTS FOR INCREASING THE AVAILABIL-
ITY FOR THE LHC

Contribution ID: **9**   Type: **not specified**

Operational availability –injector chain

Thursday 28 November 2013 14:00 (30 minutes)

Presenter: CORNELIS, Karel (CERN)

Session Classification: METHODS TO IMPROVE AVAILABILITY

Contribution ID: **10**   Type: **not specified**

Operational availability - Optimizing LHC

Thursday 28 November 2013 14:30 (30 minutes)

Presenter: PONCE, Laurette (CERN)

Session Classification: METHODS TO IMPROVE AVAILABILITY

Contribution ID: **11**   Type: **not specified**

Potentials of Petri nets for Availability Modeling and Analysis

Thursday 28 November 2013 16:15 (30 minutes)

•Introduction
•Dependability Modeling (Methods, Aspects)
•Analysis and Prediction (Method and predictable parameters)
•Tool: REALIST (Software Tool)
•Large and Complex Systems (possibilities to deal with large systems)
•Application Examples (from different applications in industry)
•Summary & Conclusions

Presenter: Dr ZEILER, Peter

Session Classification: METHODS TO IMPROVE AVAILABILITY

Contribution ID: **12**   Type: **not specified**

Availability predictions for post LS1 operation and HL-LHC

Thursday 28 November 2013 16:45 (30 minutes)

Presenter: APOLLONIO, Andrea (Vienna University of Technology (AT))

Session Classification: METHODS TO IMPROVE AVAILABILITY

Contribution ID: **13**
Type: **not specified**

Summary and Discussion

Thursday 28 November 2013 17:15 (45 minutes)

Presenter: ALL

Session Classification: METHODS TO IMPROVE AVAILABILITY

Contribution ID: **14**   Type: **not specified**

Power converters

Thursday 28 November 2013 09:45 (30 minutes)

From the powering side, the biggest risk to LHC availability is the current FGC2 implementation, and its sensitivity to radiation. If we run as we are, we will likely abort almost every mission prematurely due to FGC2 failure. A next generation FGClite is being designed to replace the FGC2 in areas which are exposed to radiation. Of some 1600 Power Converter Controllers installed at CERN around 1100 will be replaced with FGClite. This presentation will outline the predicted performance of the FGClite in the post-LS1 era. It will outline the manner in the challenges are being addressed, and the implementation chosen for FGClite. Past and future performance comparison will be done.

Presenter: UZNANSKI, Slawosz (CERN)

Session Classification: ONGOING IMPROVEMENTS FOR INCREASING THE AVAILABILITY FOR THE LHC

Contribution ID: **15**　　　　　　　　　　　　　　　　　　Type: **not specified**

Welcome address

Thursday 28 November 2013 08:30 (10 minutes)

Presenter: BORDRY, Frederick (CERN)

Session Classification: INTRODUCTION

Contribution ID: **16**

Type: **not specified**

MMP Project –available methods and tools to support LHC operation post LS1

Thursday 28 November 2013 15:30 (30 minutes)

Presenter: MUGNIER, Christophe (CERN)

Session Classification: METHODS TO IMPROVE AVAILABILITY

Contribution ID: **17**　　　　　　　　　　　　　　　　　Type: **not specified**

LHC Availability Tracking Past and Future

Thursday 28 November 2013 15:00 (30 minutes)

The LHC Availability Working Group has been looking into methods of exploiting machine and system availability metrics to optimise LHC physics production.

This presentation outlines the key methods that have been identified for individually tracking equipment and machine availability in the 2010-12 period, from this the concept of an LHC Cardiogram has been produced, showing key availability information derived from operational logbooks, machine data and equipment experts.

An extension of this method for capturing LHC availability information is outlined, called the LHC Systems Availability Tracker. This system will provide standardised availability metrics and profiles for equipment, and will provide the complete requirements, and proof of concept, for availability tracking which may be used in an integrated asset and event management tool. The proposed implementation and basic exploitation of the LSAT is shown.

A road-map is given for; the AWG, the proposed implementation of the LSAT tool and links to the Maintenance Management Project.

Presenter:　Dr TODD, Benjamin (CERN)

Session Classification:　METHODS TO IMPROVE AVAILABILITY