Follow-up of the Availability Modelling Workshop

Participants: A. Apollonio (chair), M. Blumenschein, A. Fernandez, J. Gutleber, A. Niemi, O. Rey Orozco, R. Schmidt, A. Siemko, J. Uythoven (chair), P. Van Trappen, W. Vigano.

The slides of all presentations can be found on the Indico page:

Indico link: https://indico.cern.ch/event/564619/

Introduction (J.Uythoven - slides)

J. Uythoven explained that the Availability Modelling workshop gave good ideas and momentum for a common platform. A plot from R. Schmidt detailing the manpower effort invested at CERN into reliability and availability was shown.

The present meeting is likely to be continued in the context of the Reliability and Availability Studies Working Group (RASWG), of which the mandate is pending approval by the management. As chairs of the working group J. Uythoven and A. Apollonio are being proposed and O. Rey Orozco as scientific secretary.

J. Uythoven presented the membership list for discussion. P. Van Trappen showed interest in being part of the working group. R. Schmidt proposed to include also fellows and technical students working outside MPE. A. Apollonio commented that they are already included in the participants list but not present at the moment.

The meetings are proposed to be held every two weeks on Thursdays at 15.30. J. Gutleber showed concern about the time that people might lose in meetings. A. Siemko highlighted that the purpose of the working group is to gain knowledge and will be profitable for everyone, never a waste of time. R. Schmidt agreed. J. Uythoven commented that the topics will be diverse and not always everybody will have to take part. The meetings will be kept short (1 hour). Everyone agreed to keep the working group dynamic and send the meeting minutes as information for all participants.

ACTION: Next meeting Tuesday 6th of September.

Availability Modelling Workshop: Overview, Outcome and Plans (A. Apollonio and O. Rey Orozco - slides)

O. Rey Orozco gave a brief overview of the Availability Modelling workshop held the 7th of July at CERN. The workshop was divided in two blocks: the first one focused on showing the performed and on-going RAMI studies in the accelerator domain and the second, focused in understanding the functionalities of each software, advantages and limitations. It was agreed to develop a software-features matrix and use LINAC4 as a use case for comparing the modelling process, results and similarities of different software packages. Possibility to use the LINAC4 reliability run as input data. Also, the collaboration with ESS is under discussion. A common input format of models will be proposed which with the help of an intermediate translators could be used as input for different software packages. A student coming in October to CERN will be working on the intermediate translator for Isograph.

The software features matrix was shown. O. Rey Orozco explained the meaning of each line (feature). J. Uythoven asked if the new ELMAS version is already available. A. Niemi confirmed. W. Vigano asked if the table was filled with the features of the modules used at CERN or in general. O. Rey Orozco answered that all the existing features of each software package have been included in the table, even if there is not current licence for some modules at CERN. W. Vigano highlighted that the Isograph support is very efficient. M. Blumenschein commented the possibility to include comments about the quality of the functionalities. It was agreed that this will be easier identified once the same example is studied with different software packages. A. Apollonio commented that the software matrix is a good source of information especially for people new in the field.

O. Rey Orozco explained the status of AvailSim project. AvailSim is an open source software for RAMI analysis. The third version of AvailSim is currently being implemented at ESS and the core will be ready beginning of September. There is the possibility to collaborate with ESS in the development and debugging of the software. AvailSim 3.0 to be applied to LINAC4 and CLIC availability studies. J. Uythoven commented that the collaboration with ESS would be enriching for both parties.

A. Apollonio presented the working group future plans. Availability and reliability are different terms hence, different methods are needed. Related to availability, the working group will provide support for the development of LHC and HL-LHC models and also of future machines (CLIC, LINAC4, FCC, MYRRHA). Input data for models will be taken from existing availability tracking tools. Different software packages will be used in order to validate the obtained results and identify weaknesses and strengths of them. The working group also aims at standardizing inputs for simulation. Related to reliability, the working group will provide forum and support for: reliability specifications for individual systems, evaluation of system architectures, calculation of failure rates according to standards, FMEA, Maintenance plans and use of software tools. The working group will also give support for planning, execution and testing of reliability runs. Discussions have started concerning the LINAC4 reliability run. W. Vigano mentioned that some equipment failures are not tracked by the AFT, as they cause no accelerator downtime, but it would still be good to track them. The WG would be a good place to strengthen the communication between technicians and people working on failure analysis at CERN. W. Vigano also mentioned that within his group documentation of systems is saved locally, leading to problems in the future. If the group aims at standardizing the methods, also the documentation should be standardized.

ACTION: Studies of the SPS Beam Dump reliability presentation moved to another day due to the lack of time. M. Blumenschein is not available for the next meeting.

M. Blumenschein mentioned the difficulties she found when performing a risk analysis. A. Apollonio explained how the LHC risk table was built. Assumptions need to be taken when assessing the risk (spares available, users, etc.) and the table should be scaled depending on the system to be studied.