Contribution ID: **33** Type: **oral**

Evaluation of Machine Protection Systems and Machine Protection Functions contribution to availability

Monday, 11 November 2019 09:40 (20 minutes)

When contributions to downtime (unavailability) are evaluated the main system (functions needed to perform the system requirements) and the machine protection system (functions that prevent and mitigate the consequence of a failure) are grouped together. This makes it difficult or impossible to separate how much downtime is caused by the main system and how much is caused by the machine protection system.
The main system contributes to availability by being functional and cause downtime by not being functional. Machine protection systems contribute to availability in a different way. Part of the purpose of machine protection systems is to create short downtimes to prevent long downtimes. I.e. if a piece of equipment is overheating operations are stopped in order to fault track and prevent further overheating. This causes a short downtime instead of a long downtime due to the equipment becoming damaged by overheating. The stopping of operations is the expected and desired outcome in the above scenario, but it would be recorded as a contribution to downtime instead of a reduction of downtime.
In order to evaluate how machine protection systems and functions contribute to availability they have to be separated from the main system and be treated differently.

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Session Classification: Methods