

## Six Sigma in transport of energy

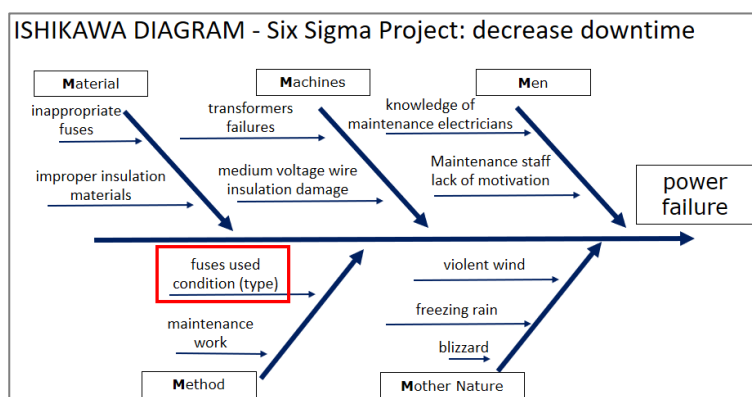
Six Sigma is a data driven process improvement methodology based on **DMAIC** cycle (Define – Measure– Analyze – Improve – Control). This methodology can be applied successfully also in transport of energy.

Examples of measurable indicators for the specific activity of transport of energy can be: Quantity of electricity delivered, coefficient of losses, average unavailability in time of facilities, line length unavailable for event, transformer / auto transformer nominal apparent power (MVA), the duration (time in hours) of unavailability to the event, etc.



An example of a successful project using Six Sigma is “decrease downtime “. The key indicator which give the performance of the process and choose to be improved is downtime ( $T_i$ ), in other words it's time due to electricity power failures. In defining the problem, the process is identified and the team which will work on this project. Specific tools this phase (**Define**) for this case can be: process map and collect voice of customer VOC.

Were collected data for  $T_i$  and for parameters that would influence it, x-i (**Measure**). Identification of factors which influence cash flow was done by Ishikawa (see picture below).



$T_i$  may be influenced by: transformers failures, medium voltage wire insulation damage, weather conditions (wind, blizzards, freezing rain), fuse status, maintenance work (periodic inspections and repairs) etc. These parameters are called potential causes. If we demonstrate with data the influence, potential causes can become root causes (**Analyze**). Here we can use more advanced techniques such as hypothesis testing.



After finding the root causes, in our case for example fuse status, we proceed to identify solutions that implemented would eliminate or diminish the negative effects for which it was made the project (**Improvement**)

To find solutions was used Brainstorming. Choosing the most efficient, those who consumed the fewest resources or those that are implemented as quickly as possible can be done using Prioritization Diagram and Cause – Effect Matrix (Pugh). “Using only calibrated fuses” was the chosen solution. In **Control**, procurement procedure fuses were changed. After implementing downtime was reduced by 30%.

We invite you to Six Sigma courses organized by Effective Flux to reap the benefits of this methodology.