**Problem Statement-1**

**Title of Problem Statement:** Application or Development of methodology/instruments for advance prediction of minor faults (especially 2m-5m) dykes, sills, and local water bodies etc. which are present up to 350m ahead of the UG mine panel face development.

**Issues:**

Multiple seam working of Under Ground (UG) Coal Mining are very prominent in various coal fields especially, BCCL & ECL areas. Some of these mine workings are even dated back to pre-independent era, wherein lack of accurate survey/mine plans pose serious problem for planning future mining operations of deeper seams. During course of time, most of the mines have been abandoned which may have potential coal resources. However, with the recent initiative of Govt. of India to extract the potential coal seams, these abandoned UG mines are being allotted to various bidders.

For extracting the coal seams from the abandoned mines, following critical challenges need to be addressed:

* Information about occurrence of minor faults (especially 2m-5m) dykes, sills, and local water bodies etc. which are not available in Geological report, pose serious hindrance while preparing the panels for long wall mining and even creating safety issues.
* Application of available technology such as Resistivity Imaging, Seismic survey or Geophysical logging etc. to address above mentioned problems is not feasible due to the major limitations in terms of water logged upper seam workings and densely populated areas above UG working etc.

**Expected Outcome:**

1. Application of any existing methodology for advance predictions of said geological features that may hinder the UG mine operations during development of panels
2. In the absence of any existing technology, development of robust instruments is required.
3. Development of suitable sensors that can be mounted on existing machinery used for UG panel development or development of standalone instrument for the said advance predictions.
4. Methodology similar to Tunnel Seismic Profiling (TPS) may also be explored.

**Mentors:**

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