Project Title: Developing 3D Stream line based simulation for Field Development (Software)

1. **Major Objective**

To develop Streamline (SL) based flow simulator for complex and heterogeneous reservoirs where fluid flow is dictated by well positions and rates, rock properties (permeability, porosity etc.) and mobility of fluids

2. **Proposed Methodology**

Project work algorithms should include modern SL concepts such as:

- Tracing three-dimensional (3D) streamlines in terms of time-of-flight (TOF);
- Periodic updating of streamlines;
- Numerical 1D transport solutions along streamlines;
- Application to compressible flow and including gravity effects etc.

3. **Scope of work**

- Build a software tool kit for stream line based simulation based on recent/modern advancements.
- Compatible with industry simulators for visualization and data interchange
- Applicability should include Waterflood management with streamline simulation
    - Inj-Prod relation, pattern optimization, breakthrough, optimization of well placement
    - Calculation of drainage volume and irrigation volume (Individual well efficiency)
    - Demonstration of reservoir connectivity, Bypassed oil identification and unswept areas
- Streamlines guided History matching (for Modifying parameters) and improving forecasts

4. **Deliverables**

- Develop a 3D Streamline Simulator for optimizing field development plan
- Demonstrate its capability to complement reservoir simulators in improving history matching and forecast
- Real Case demonstration of selected ONGC field (minimum 2 fields) for optimization of waterflood using developed SL method

5. **Relevance to ONGC**

- Software will improve understanding of reservoir dynamics for optimizing field development (mainly waterflood) in various fields of ONGC
- Will enable application of modern SL for brownfield development to optimize recovery
- Software will be cost effective solution with open license which is not available in ONGC, at present
- Exposure to reservoir engineers in formulation of SL based software will help in competency development

6. **Time Frame:** 3 years

7. **Budget:** Indicative budget ~45 Lakhs

8. **Proposed IIT:** IIT Delhi/ IIT (ISM), Dhanbad