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## N444: Development Planning For Mature Fields

Instructor(s): Jerry Hadwin

### Format and Duration

Classroom - 3 Days

Virtual - 5 Sessions

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### Summary

This multidisciplinary course is designed to give participants a broad appreciation of the evaluation and planning activities associated with incremental development planning. This course takes groups through a wide range of associated issues, fills any knowledge gaps in the essential technical fundamentals required for mature field development planning and uses a case-based exercise which will run through the whole course.

**Business Impact:** This course equips participants with the knowledge and **decision-making skills** to create a **robust development plan for mature fields**.

### Learning Outcomes

Participants will learn to:

1. Characterise the overall challenges associated with mature field developments.
2. Evaluate critical insights from subsurface data and apply this to modelling options and recovery methods.
3. Assess associated well data, typical late life issues and drilling and completion options for mature developments.
4. Manage the role of risk and uncertainty when making mature field development planning decisions.
5. Prepare a strategy and implementation plan.

### Training Method

This is a classroom or virtual classroom course comprising a mixture of lectures, discussion, case studies, and practical exercises.

### Who Should Attend

The course is designed for mid-career subsurface professionals, specifically petroleum engineers and geoscientists who play a part in evaluating, screening and maturing oil and gas field development opportunities in mature fields. Participation would also benefit technical team leaders and managers who want to gain an insight into the challenges, uncertainties and preparations involved in development planning for mature fields.

### Course Content

Mature fields differ from greenfield developments in that major infrastructure is in place, static reservoir data has accumulated from development drilling and a growing volume of production data has become available. Decisions therefore relate to incremental projects, which may be small in scope and are often economically marginal. A firm understanding of the technical fundamentals associated with reservoir, wells and surface facilities is therefore required to make quality decisions in this environment, supported by an

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understanding of incremental project economics.

### Challenges of mature field developments

- Open discussion covering smaller target sizes, costs, efficiencies, perceptions

### Mature field development strategies

- What is strategy? The difference between green and brownfield decision making
- Framework (choices, boundaries, selection criteria, framing decisions)
- Evaluation methods
- Workflows, overview of tools

### Mature oil fields

- Subsurface: getting insights from data (surveillance mapping), recovery mechanisms, modelling options (analytical, sector, full field), history matching, EOR
- Wells: understanding well data, typical late life issues (flow assurance), drilling and completion options (including workovers)
- Surface: understanding surface data (including allocation), surface options e.g. debottlenecking

### Mature gas fields

- Subsurface: insights from data, modelling options, gas condensate issues e.g. condensate banking
- Wells: gas issues e.g. liquid loading
- Surface: gas issues e.g. late life compression

### Economics

- Typical economic decision making criteria
- The importance and pitfalls of incremental economics
- Finding the optimal development strategy

### Decision making

- Evaluation methods
- Dealing with risk and uncertainty
- Biases in decision making
- How to make the best decision

### Implementing and development managing the selected plan

- Building the plan
- Managing the plan when it goes off track

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### Wrap-up

#### Practical Exercises:

This course integrates practical exercises to complement theoretical learning. Exercise topics include:

- LTRO, remaining potential
- Decline analysis
- LTP forecasting
- Managing producing wells
- Managing the surface (facilities and maintenance)