



## Innovative Development Planning

For Xodus Group, development planning is a core activity

Our development planning experience stretches around the world, from the mature fields of the North Sea to greenfield sites off West Africa, South East Asia and Australia.

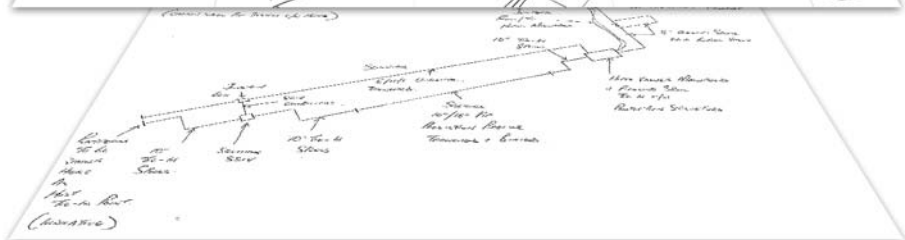
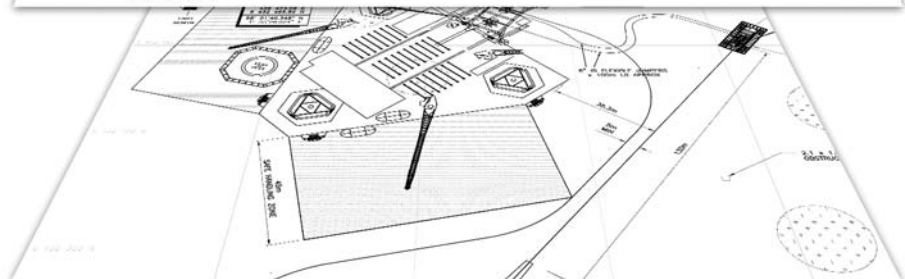
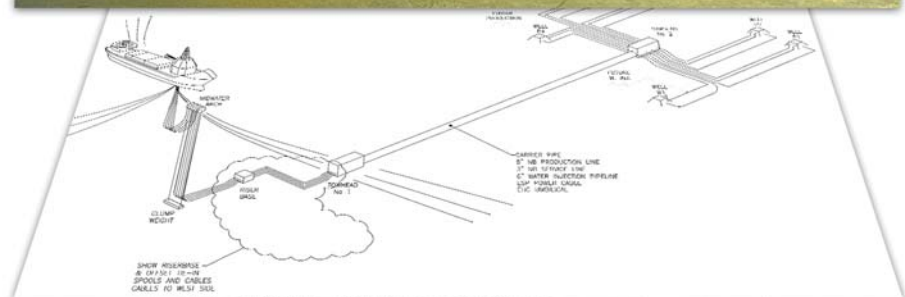
Projects we have worked on range from small-scale tie-backs to large-scale offshore development projects, from unmanned shallow-water oil and gas facilities to world-class deepwater developments for exploiting gas condensates.

The broad range of skills within our integrated development team covers petroleum engineering, subsea, pipelines and flow assurance, as well as deepwater engineering, process management, mechanical and structural engineering, and many other disciplines. We share knowledge and information with our teams and clients, applying proven techniques to the identification, analysis and screening of concept options. Our multidisciplinary approach enables us to analyse the many factors that affect a development planning project, identifying the best solutions for projects ranging from single-well production facilities through to complex multi-well, multi-facility developments.

### Streamlining the decision-making process

Using structured brainstorming and facilitation techniques, we identify key risks and uncertainties, highlight concept differentiators and the elements that impact on a project's overall feasibility, plot clear audit trails for all key decision-making, and produce the ideas needed to bring key stakeholders on board.

We challenge conventional assumptions by thinking laterally – over the years we have learned how to bypass or streamline problem areas, using best-in-class tools and techniques to generate robust, cost-effective development plans.



We use benchmarking and analogue comparison tools to generate concepts tailored to match our clients' specific priorities and production requirements. Our role is to assist and facilitate the decision-making process by producing development scenarios based on accurate, relevant information from a wide variety of sources. We cover each stage in the development planning process, first screening appraisals, then generating, screening and drawing up a shortlist of concepts. We hold decision workshops to facilitate the selection of the final development concept, then help our clients prepare the basis for the design work.

### Skills that meet your needs, as and when they arise

You can call upon our expertise at any stage in a development project. We have the skills and knowledge to help your teams with production modelling, process and facility design, and benchmarking and assurance reviews. Advanced structural analysis, PDMS, electrical and electronic engineering, and control systems expertise are just some of the skills we have added to our technical armoury so we can maintain the cutting-edge standards that make us your ideal development planning partner.

### Cost estimating

This breadth and depth of expertise underpins another key skill: our ability to produce robust cost estimates for all foreseeable concepts that might apply to your specific development planning project. Using our industry-leading cost analysis tool, XPERT<sup>1</sup>, we can produce

order-of-magnitude costs for rapid concept screening, or drill down into conceptual details by taking into account industry norms, up-to-date equipment costs, our comprehensive database of drilling and vessel costs, and our proprietary equipment-sizing algorithms. Because XPERT interfaces easily with other industry-leading applications such as HYSYS<sup>®</sup> and PIPESIM<sup>®</sup>, our cost estimates are based on reliable models and projections.

### Concept screening in more detail

Our approach to analysing the opportunities offered by a development planning project is holistic. By incorporating quantitative and qualitative techniques as appropriate, and using sophisticated simulation and modelling tools to correlate the collected data, we can suggest robust solutions to issues ranging from complete development planning projects right down to individual equipment-level decisions.

Our simulation expertise is unmatched. Using Integrated Production Modelling (IPM), steady-state and transient process and flow assurance simulations, offshore facility weight estimates and cost / weight / schedule benchmarking, we generate weighted scores or matched-pair analyses to examine every permutation of the various options available.

But we go much further, using comprehensive economic models to capture CAPEX, OPEX, availability and scheduling data in order to measure NPV and cost/performance ratios. The validity of these models is tested against

weighted qualitative criteria applied to safety, environmental issues and technical risk, obtained through intensive, facilitated discussions with key management personnel.

We also identify key issues that are better defined as hurdles rather than ranking criteria, such as safety, thereby helping our clients to avoid the trap of attempting to rank projects according to non-negotiable criteria. We have the experience required to focus the decision-making process on measurable variables, defined in close collaboration with your teams.

### Interfacing across disciplines

The many different disciplines involved in development planning mean that it is not easy to assess the level of detail required, or quickly sift concepts down to a manageable number, or manage the risks associated with each stage in the development planning process. We can talk to your experts because of our own range of expertise. We bring the same approach, procedures and core engineering skills to bear on every project, but we also apply regional expertise as required – to cater for the tiebacks into existing host facilities that characterise more mature markets, for example, or tackle deepwater developments in challenging locations.

Take advantage of our combined skills and experience to build an optimised development plan quickly, efficiently and cost-effectively. Talk to us about your next development project.



Field development conceptualisation.