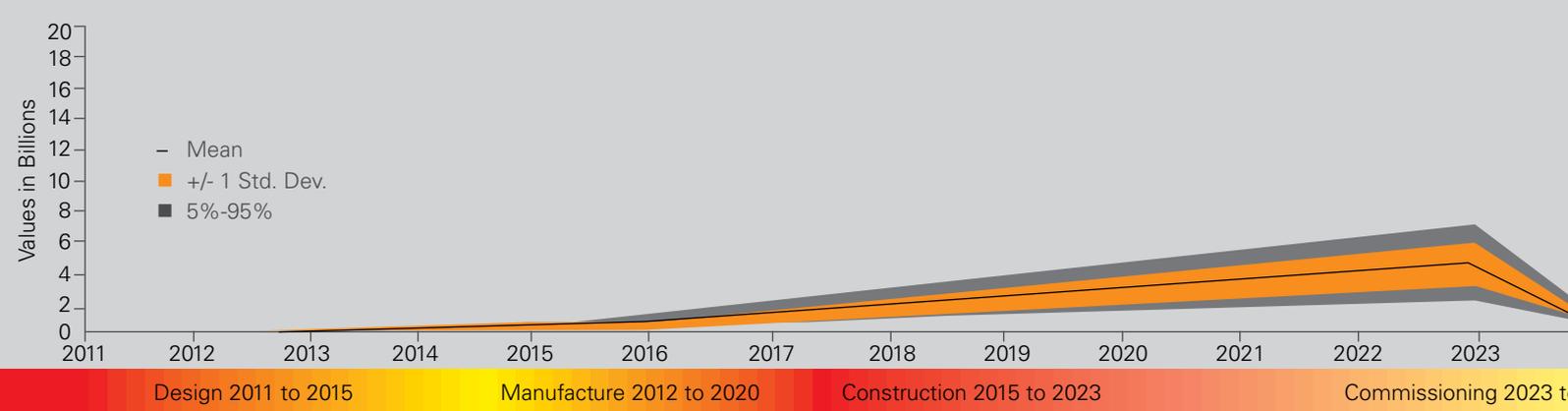




JUST WHEN YOU THOUGHT IT WAS SAFE
A PASSION FOR RISK MANAGEMENT

SGS



The graph shows the relationship between cumulative cost risk for Construction contrasted with cumulative cost risk for O&M for a generalised range of infrastructure mega-projects where typically O&M costs can equal twice the construction costs.



A PASSION FOR RISK MANAGEMENT

SGS Risk Management provides a whole life risk management process for major projects. Our team of risk specialists brings together the range of skills and expertise essential to effective programme planning, project control, risk assessment of design, manufacture, construction, commissioning and O&M for the life of the asset.

WHOLE LIFE PROJECT RISK

It is well known that the O&M costs of the asset can be up to twice the construction cost*. We, therefore, put our risk team in place at the very outset of the project. The risk analysts set out to capture the risks of all design options in order to provide management and engineers with the necessary risk information to ensure that the project meets the required performance e. g. availability and output, construction cost and schedules, as well as design life O&M costs.

DESIGN RISK AND ITS IMPACT ON RETURN ON INVESTMENT (ROI)

Engineering decisions are being made continuously from the start of the project. SGS will examine the risks associated with each decision to determine the overall impact of design and engineering decisions on the delivery of the project over its expected life. A variety of tools are used ranging through multi-criteria decision analysis (MCDA), Bayesian networks, Monte Carlo simulation, system dynamics modelling and failure mode effects criticality analysis (FMECA). The results of the analyses are comprehensively reported to engineers, project management/controls and finance teams to ensure that the project performance is optimised and costs are minimised.

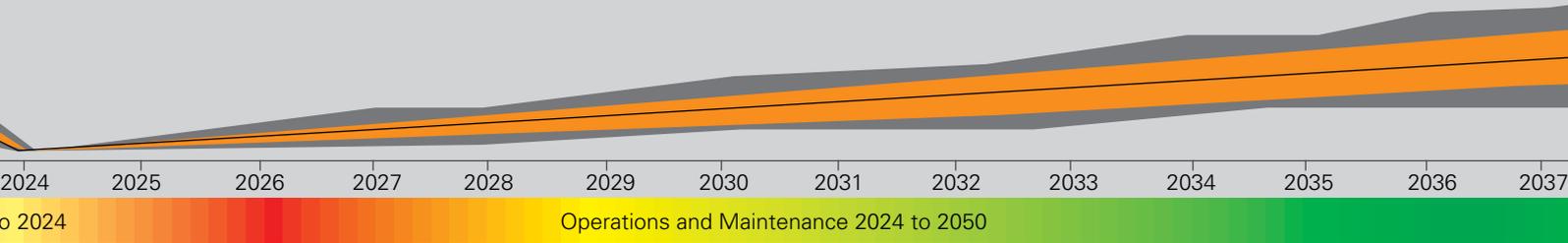
* <http://www.ogc.gov.uk/documents/CP0067AEGuide7.pdf>

MANUFACTURE AND CONSTRUCTION RISK

At all stages of the project there will be uncertainties attached to the design, manufacture, construction and operation of an asset. Our SGS risk management team targets all possible relevant and significant risks for example a modest off-shore wind farm (70 WTGs 3MW) may have over a thousand risks on the risk registers for construction alone which all have to be managed. Many of the manufacturing, construction and HSE risks will be on the critical path directly impacting on the TOC –failure to complete on time will result in massive cost as a result of ‘loss of production’ or penalty charges as well as interest charges which will directly affect ROI. The SGS risk management team devotes significant effort to working with the project team to develop risk handling plans and ensuring that they are implemented as well as evaluating the effectiveness of the handling plans.

INCORPORATING COST PERFORMANCE AND SCHEDULE RISK IN THE BUSINESS MODEL

The SGS team works with the finance team to integrate fully the risk assessment and simulation analyses for cost, schedule and performance into the business models in order to provide the management and funders with the information necessary to determine ROI and NPV for the design life cycle of the project. We also provide the demonstrable evidence that an effective risk management process is in place.



The graph demonstrates the enormous variability of cost risk during the project making whole life costing absolutely essential.

PLANNING AND SCHEDULING

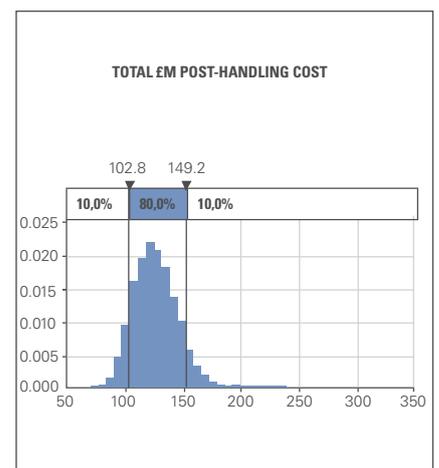
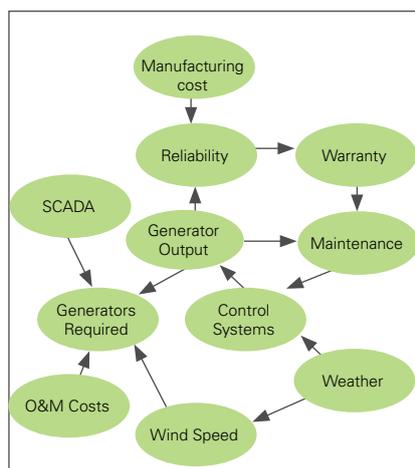
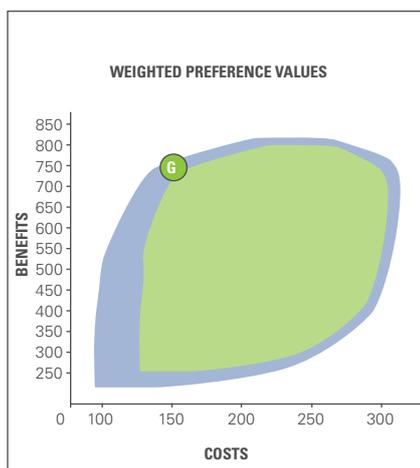
Our project team can provide schedule risk analyses using Primavera Risk or @Risk for projects. From the very outset our team will be focussed on ensuring that all aspects of cost and schedule risk are incorporated into the project plan and that proper schedule risk simulation is carried out.

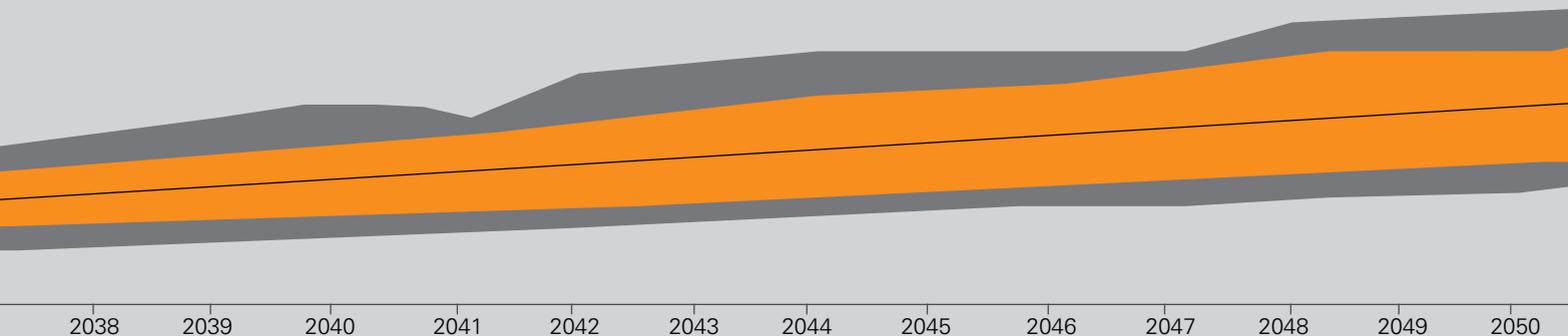
DESCRIPTION	REM DURATION	2006												2007											
		S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A
Pre-Bid & Bid	84	[Gantt bar spanning from start of 2006 to end of 2006]																							
Characterisation	10	[Gantt bar in early 2006]																							
Pre design & optioneering	15	[Gantt bar in early 2006]																							
Feasibility & Design	50	[Gantt bar in early 2006]																							
Engineering	315	[Gantt bar spanning from early 2006 to mid-2007]																							
Front End Eng Design	40	[Gantt bar in early 2006]																							
Scheme paper	60	[Gantt bar in early 2006]																							
Board approvals	10	[Gantt bar in early 2006]																							
Design development	80	[Gantt bar in early 2006]																							
Contract process	120	[Gantt bar in early 2006]																							
Safety case	54	[Gantt bar in early 2006]																							
External approvals	55	[Gantt bar in early 2006]																							
Procurement	252	[Gantt bar spanning from mid-2006 to mid-2007]																							
Implementation	80	[Gantt bar in mid-2007]																							
Site mobilisation	110	[Gantt bar in mid-2007]																							
Procure 3 rd party contractors	30	[Gantt bar in mid-2007]																							

ANALYSES

SGS uses a wide variety of analysis methods and tools from MCDA to FMECA e. g.

- MCDA cost benefit decision analysis using for a complex engineering problem with 6×10^{15} possible options using Equity 3
- Engineering decisions using Bayesian Networks
- Monte Carlo simulation of project cost risks

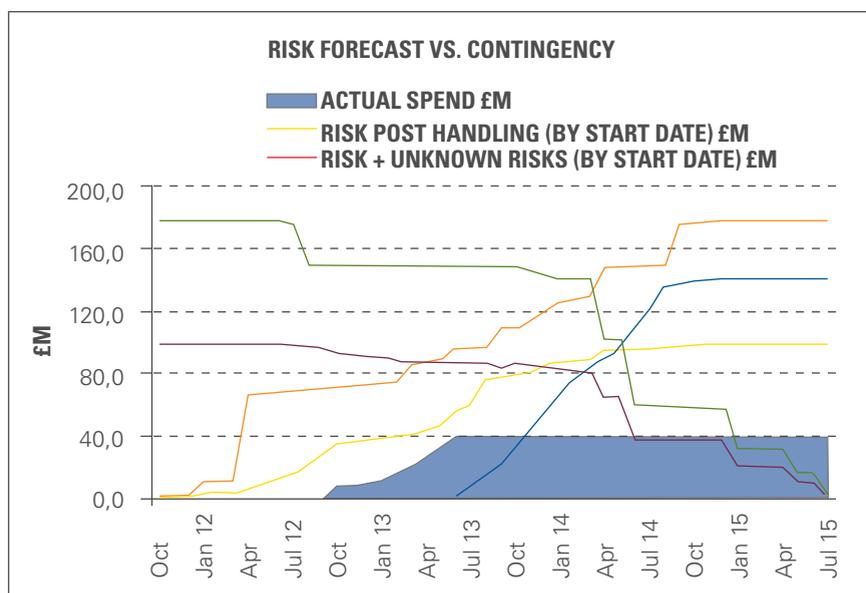




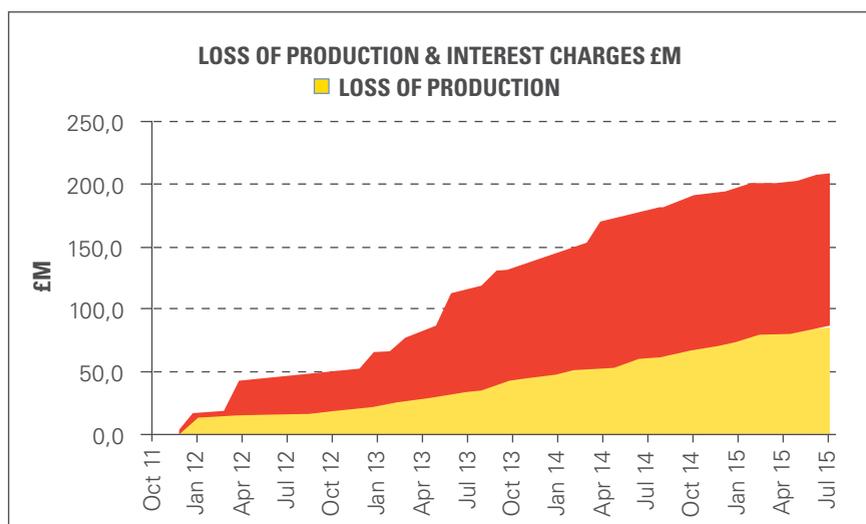
The coloured bar beneath the graph shows the ebb and flow of risk over the lifetime of the project (Multitudinous seas incarnadine making the green one red. Macbeth Act II scene 2, 54-60) high risk= red, low risk=green.

COMPREHENSIVE REPORTING AND RISK COMMUNICATIONS

The SGS team produces a wide variety of relevant and timely reports on the risks faced by the management team and the uncertainty attached to decisions must be made. The SGS risk team has developed a valuable algorithm for estimating the impact of unknown risks on the project.



Simulated risk over time with unknown risk and contingency estimates compared actual risk costs incurred.



Simulated loss of production and interest charges as a result of schedule risk.

The wide variety of different analyses are reported either as an in depth comprehensive report or in summary or as dashboard reports. Throughout, the emphasis is always in highlighting risks that will be detrimental to the overall project so that the project team can focus on implementing handling plans to manage risk.

For SGS the timeliness of the report is critical in ensuring that the necessary information is available for management decisions.



RISK STANDARDS

The SGS risk management process is implemented in full compliance with international standards e. g. ISO 31000, as a minimum requirement. The SGS team is committed to improving the delivery of risk management in terms of statistical processes, facilitated workshops for identification and assessment, development of better graphical communications of risk, more calibrated assessments, off-setting of bias in assessments, innovation in analysis and improved simulations.

AUDITABILITY AND COMPLIANCE

In anticipation that there will be a variety of internal and external audits of the risk management process SGS ensures that every aspect is fully documented from project execution plan, business process, risk implementation guides, methodological analyses, risk registers, risk database and reports. Every care is taken to ensure that there is full compliance with international standards and client corporate requirements.

TOTAL COMMITMENT, OVERWHELMING ENTHUSIASM AND PURSUIT OF INNOVATION

What makes the SGS Risk Competence Centre different is the total commitment to delivery of a superior risk management process which far surpasses other offerings. Every member of the risk team is passionate about risk, its identification and quantification, the modelling and the simulation. This commitment and enthusiasm translates into the delivery of greater depth of analysis, greater accuracy and on-going pursuit of improvements in methodology and reporting. The SGS team delivers with single minded purpose, the information that can ensure that megaprojects are completed on time, on budget and to specification.

You can be sure that the SGS team will implement a risk management process that will exceed your expectations, satisfy the most demanding of banks, ensure that venture partners can see the project is under control, permit the management and project teams to make correct decisions as a result of essential, timely and accurate information on uncertainty, impact and risk.

MARKETS

- Wind Energy
- Tidal Energy
- Hydroelectric Power
- Nuclear Power
- Infrastructure
 - Rail
 - Road
 - Airports
 - Ports
 - Buildings
- Mining
- Oil & Gas

SERVICES

- Project Risk Management
 - Cost risk
 - Schedule risk
 - Performance risk
 - Project controls
 - HSE risk
- O&M Risk Management
 - Maintenance scheduling
 - Health, Safety & Environment (HSE)
 - Safety Integrity Level (SIL)
 - Hazard And Operability (HAZOP)
 - Hazard Identification (HAZID)
 - Process Hazard Analyses (PHA)
 - Quantitative Risk Analyses (QRA)
 - As Low As Reasonably Practical (ALARP)
 - BowTie

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WHEN YOU NEED TO BE SURE

