

St Fergus FOSR - Appendix I - Risk Register

Title	Description	Cause	Impact
Interface Factor for Site Project Management	Interface factor to account for site management as they might be other works going on at the time of execution.	Multiple other site works outside of the FOS project being undertaken in parallel	Increase to site management costs
Procurement / Contracting strategy	OfGEM may not support NGG's proposed Procurement / Contracting strategy for future phases of FOS	"OfGEM do not consider our strategy or preferred solution provides the best value for Consumers. "	"Delay in funding decisions leading to increased asset risk. Re-working FEED Feasibility leading to increased cost and timescale. Required change of Procurement / Contracting strategy leading to increased FEED costs and overall delay to delivery of solution "
Existing pipework conditions	There is a risk of finding NORM when cutting into existing pipework to undertake valve replacements	Progressing with Valve replacements	This will require additional time for decontamination resulting in an extension of time for the NGG and Contractor projects teams.
Land Acquisition	"There may be delays in agreeing land acquisition and / or land acquisition costs exceed estimate. "	Potential for looking at a Greenfield build option as part of the FOS works	Additional land acquisition costs + programme delays
Planning permission vs Permitted Development	There is the potential for issues with planning and in particular cab stack heights allowed under permitted development being no more than 15m in height.	Not permitted development. Planning conditions may impose constraints on construction works (eg height of vent stacks or compressor exhausts).	Additional costs and substantial delays for re-design. New planning application required.
Outage Availability	Outages may be unavailable / cancelled or that the outage programme cannot be completed on time or is missed completely	Conflicting gas demands and availability. Outages are required during some phases of work and for final commissioning for which they cannot be obtained. Delays resulting in the need to accelerate the outage work in order to complete the work within the current programme outage end date. "	Delay to programme and additional costs

Non-approval of Preferred Solution	There is a risk that OfGEM do not support the NGG preferred solution.	Uncertainty around FES, Hydrogen future and / or carbon capture	"Delay in funding decisions leading to increased asset risk. Re-working FEED Feasibility leading to increased cost and timescale.
Unknown Asset Condition	Poor asset condition leading to refurbishment, replacements or the scope of works to increase	"Interface points to existing assets is problematic. Condition of the existing assets is considerably worse than envisaged. Asset health has degraded over time	"Additional cost relating to refurbishment / replacement of assets, associated programme delays and potential additional scope
Uncontrollable Delays with OEM Procurement	Uncontrollable delays in delivery of new OEM equipment	Due to current world fluctuations in material costs and global issues, the inability to control delivery schedules	Delays to programme and inflation in overall project costs.
Third Party Interface with Px/NSMP	There is the potential for conflict with third party operators at site (Px/NSMP) with the new greenfield option or potential changes to operating parameters	Conflict with third parties and changes to third party operating parameters	Regular stakeholder engagement throughout the process to ensure all parties are on the same page
Contractor Travel / Lodge Cost Uplift	There is a risk that upon tendering of the design / construction works that inflated costs will be used by potential contractors due to the remote location of the St Fergus Gas Terminal.	Location of site / Availability of resource in local area.	Inflated costs received from contractor.
Contaminated Land	There is a risk of finding that excavated ground material as part of below ground valve replacements is found to be contaminated. This will require the material to be processed resulting in additional cost for processing and also suitable replacement back fill material	Historic release of fluids could have contaminated land	Additional cost for processing contaminated material and replacing with suitable back fill material
Existing Plant 1 and Plant 2 Berth Condition	Existing Plant 1 and Plant 2 Avon 1533 Berths are not structurally adequate or dimensionally available to accommodate new units and require rework.	Lack of existing base survey information (cubes/pile tests/base details)	Delay to options development
Material Take Off Quality	Proposed options pipework and fittings / electrical and IS take offs not adequate due to maturity of design and will increase overall project costs.	Maturity of design	Increase to overall procurement costs.

Alba DLE Trials Potential Test Run Delays	There is the potential for further delay to the proposed Alba DLE testing / validation works at Kirriemuir planned imminently which potentially could result in a swing of the preferred MCP option.	Delay to DLE testing / validation	Rework and Revisit of Options selection.
Materials delivery cost fluctuation due to site location.	There is a risk that the delivery charges and costs for delivery of materials to site may fluctuate due to the remote location of the St Fergus site.	Remote location of site	Increase to delivery and carriage costs and charges
Extreme Weather	Construction works are affected or suspended by extreme weather	Construction works are vulnerable to extreme weather which exceeds the 1-in-10 year value of the specified weather data	Compensation Event for delay and / or additional costs directly attributable to extent of extreme weather above 1-in-10 year value. Cost of project acceleration to recover lost time
Proximity of Greenfield Option to Px Offices and Car Park Area	Proximity of Greenfield Option Location to adjoining Px Offices and Car Park	Construction of the proposed Greenfield options at St Fergus are to the SE corner of the existing site and are in close proximity to the adjoining Px offices and car park.	The NG Building Risk Assessment for offices and access will need to be revisited ad/or a new assessment undertaken for the Px/greenfield build area
Energy Efficiency Requirements introduced for MCPD (via Bref)	There is a risk that energy efficiency requirements are introduced for MCPD (via Bref) which cannot be achieved by the existing Avons making retrofit options unacceptable resulting in having to revert to new units	Change to policy	Regular updates on current policy status
Discontinued Development of the Alba DLE Emissions Abatement Solution	There is a risk that Alba power discontinue development of the Avon DLE option prior to installation/commissioning at St Fergus resulting in National Grid being forced to seek an alternative solution with potential programme and cost impact	Discontinuation of DLE product	Revisiting of design works to visit other potential options.
Existing drainage and ducting not fit for reuse with brownfield option	Condition Assessments of existing drainage, ducting and existing compressor base to be undertaken as there is a risk that should brownfield option be pursued that they are inadequate for use with the prescribed option	Existing assets unsuitable / inadequate	Rework to design / further survey work required
Existing Vent Strack Condition Assessment	Vent Stack tie into to existing vent stacks at site. Existing vent stack structure may not be sufficient for additional vent line installation	Inadequate structural rigidity	Rework to design / additional survey work required.

Adequacy of Existing Avon Fuel Gas Heating and Lube Oil Systems	Utilisation of existing Fuel Gas Heating and Lube oil systems on existing Avon's should brownfield be utilised not being adequate.	Inadequacy of existing asset for future works	Rework to design / additional survey work
Decommissioning Methods	Decommissioning methods and techniques required to assure sufficient safety standards may prolong decommissioning activities	At current Feasibility stage, decommissioning methodologies have not been detailed or risk assessed	Additional cost and delay associated with labour intensive decommissioning methods (hand digging, cold cutting, small sections etc).
Delays to Funding by OfGEM	There is a risk that delayed regulatory funding could delay the projects and make tenders more expensive due to contractors having to commit to holding prices or limited numbers of contractors tendering.	Delay to funding	Inflation of project costs
Installation of new cab enclosures - site planning restrictions	Installation of new Cab enclosures - Site planning restriction	There is a height limitation under the permitted development planning at St Fergus of 15m. Indicative information from the GT OEMs suggest that new Cab enclosures will be over this height resulting in the need for planning permission to be applied for.	Extension to project delivery times
Avon Machinery Train Condition Assessment	There is a risk that the condition of the Avon Machinery Train is considerably worse than envisaged which may question the viability of the intention of overhauling and upgrading and potential retrofit solutions.	Existing Avon machinery train is in worst operational condition than expected	Revisit of design and options selection and/or prolonged repair and maintenance works
Unknown Ground Conditions	Unknown / undocumented obstructions below ground may be discovered during construction. Poor ground conditions worse than expected	Exact location of buried services not known and / or presence of undocumented services. Possible archaeological site or UXO identified. Unknown ground conditions. Detailed surveys not completed	Additional costs and associated delays for extra ground works, possible amendment to design and remediation
Brownfield New Unit Build Option	Brownfield New Unit Build Option - Potential Plant spacing / proximity issues in line with T/SP/G37	T/SP/G/37 stipulates the separation distances required between new build cabs and that a minimum separation distance of 6 m is required between each access. In the brownfield locations space is very tight and this may be difficult to achieve in some circumstances.	Potential for relocation of plant to an alternative location

High Water Table at St Fergus - Overpumping / Dewatering Requirements	High water table know to be present at St Fergus	High Water Table	Potential for undermining of land during excavation / requirement for dewatering plant / additional design / construction issues through need for temporary works design.
Gas Isolation	There is a risk that during the construction phase the isolation of process gas to enable tie-ins may not be possible using the preferred isolation valves due to the valves passing and not sealing	Existing state of isolation Valves may be passing (unable to provide isolation)	Impact further on operational plant and outages for isolation may be further constrained resulting in programme delays.
Use of Stoppling / Flow Management for Outage Works	There is an opportunity to utilise stoppling / specialist flow isolation equipment to enable the new unit tie in works to the suction and discharge headers on Pant 1 and Plant 2 at St Fergus	Tie in works to existing headers	Potential to minimise outage periods to achieve tie in works.
Offsite Modular Build	There is an opportunity for the offsite modular build of certain aspect of the project (compressors / suction and discharge pipework)	Potential for offsite fabrication and construction works	Less onsite construction works, potential improvement to schedule.
UKCS Gas Flows	UKCS gas flows may not reduce as predicted in FES2020	"FES are only predictions and UK Energy Policy is in constant review	"Abortive cost of design, materials and temporary works associated with the removal of UKCS related assets.
UKCS Gas Flow Reduction	There is a risk that UKCS gas flows reduce more than predicted in FES2020	Change in forecasted gas requirement	Options/Equipment may be incorrectly sized flows may not be seen.
Sequencing of build works to ensure continued gas delivery	There is a risk that the outages required to facilitate the Plant 1 and 2 manifold connections cannot be achieved during the required time windows resulting in a delay to the delivery of the solution	Outage Availability	Delay to delivery of proposed solution.
Uplift to resource costs due to remote location of St Fergus	There is the potential that there will be an uplift in resource costs	Uplift in rates	Increase to total project costs.
Uplift to material costs due to the increasing prices of raw materials	There is the potential for raw material costs to be higher than expected	Uplift in raw material costs	Increase to total project costs.