

# Proposed Revisions DBNGP Access Arrangement

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*2016 – 2020 Access Arrangement Period*

*Forecast capital expenditure*

*Supporting Submission: 9*



PUBLIC

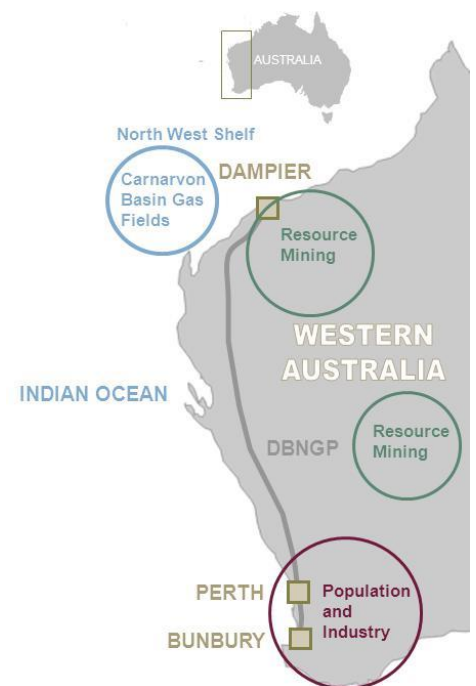
*Date Submitted: 31/12/2014*

## CONFIDENTIALITY

- 1.1 This submission is provided to the ERA to assist it in its assessment of the proposed revisions to the DBNGP Access Arrangement.
- 1.2 Some information contained in the submission is confidential and commercially sensitive. The reasons for DBP's claim of confidentiality are outlined in Appendix B: to this submission.
- 1.3 A public *version* of this submission will be provided separately.
- 1.4 Accordingly, this version of the submission is provided to the ERA on the following conditions:
  - (a) it is to be used by the ERA solely for the purposes of assessing the proposed revisions to the DBNGP Access Arrangement;
  - (b) it is not to be disclosed to any person other than the following without DBP's prior written approval:
    - (i) those staff of the ERA who are involved in assisting the ERA in its assessment process; and
    - (ii) those of the ERA's consultants who are involved in assisting the ERA in its assessment process and who have appropriate confidentiality undertakings in place.

*DBP Transmission (DBP) is the owner and operator of the Dampier to Bunbury Natural Gas Pipeline (DBNGP), Western Australia's most important piece of energy infrastructure.*

*The DBNGP is WA's key gas transmission pipeline stretching almost 1600 kilometres and linking the gas fields located in the Carnarvon Basin off the Pilbara coast with population centres and industry in the south-west of the State*



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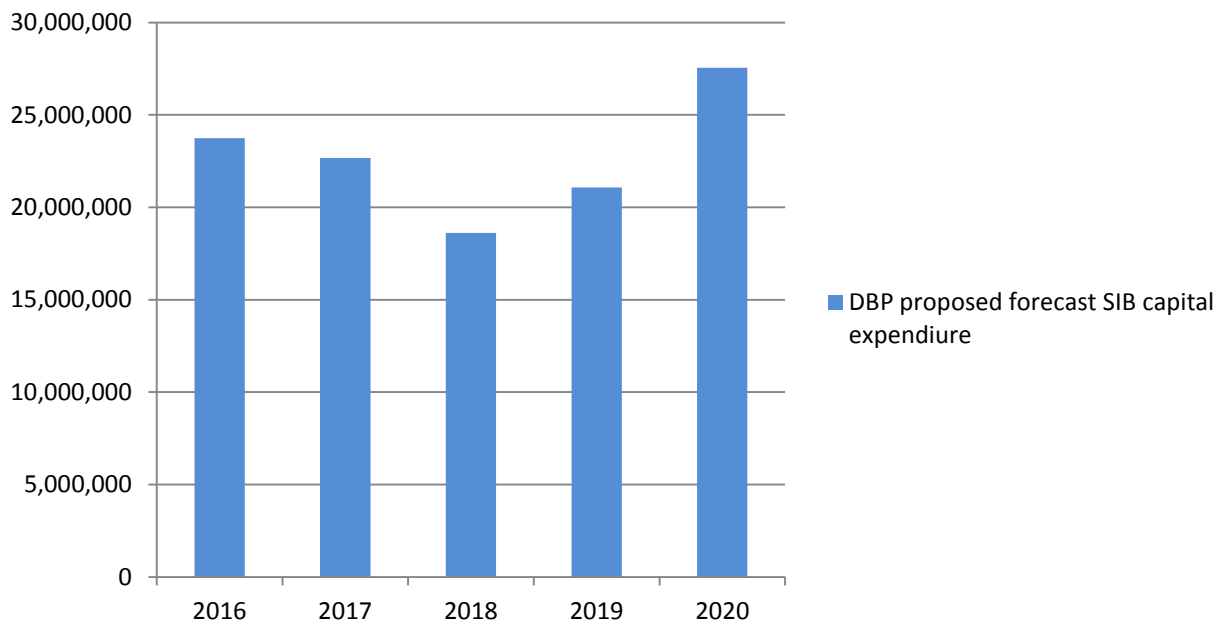
## 1. INTRODUCTION

- 1.1 On 31 December 2014, DBNGP (WA) Transmission Pty Ltd (DBP) filed the following documents with the Economic Regulation Authority of Western Australia (ERA):
  - (a) proposed revised Access Arrangement (**Proposed Revised AA**); and
  - (b) proposed revised Access Arrangement Information (**Proposed Revised AAI**).
- 1.2 These documents are proposed to cover the access arrangement period commencing on 1 January 2016 and ending on 31 December 2020 (**AA Period**)
- 1.3 These documents contain the information that the National Gas Access (WA) Act 2009 (NGA) (which includes the Western Australian National Gas Access Law text (NGL) and the National Gas Rules (NGR)) requires to be included in order to enable them to be approved by the ERA.
- 1.4 In addition to the Proposed Revised AA and Proposed Revised AAI, a number of additional supporting submissions were filed to assist the ERA in assessing the Proposed Revised AA. These included the following:
  - (a) Submission 1: Proposal
  - (b) Submission 2: Cost Controls and Governance
  - (c) Submission 3: Proposed Reference Service
  - (d) Submission 4: Terms and Conditions
  - (e) Submission 5: Non-tariff related issues
  - (f) Submission 6: Cost Verification and Allocation
  - (g) Submission 7: Actual Capital Expenditure (Expansion)
  - (h) Submission 8 Actual Capital Expenditure (Stay-in-Business) (Part 1 & 2)
  - (i) Submission 9: Forecast Capital Expenditure
  - (j) Submission 10: Forecast Operating Expenditure
  - (k) Submission 11: Capacity and throughput forecast
  - (l) Submission 12: Rate of Return
  - (m) Submission 13: Total Revenue
  - (n) Submission 14: Tariff model and tariff calculation
- 1.5 This submission contains further supporting information in relation to the regarding proposed forecast capital expenditure for the AA Period.

## 2. PROPOSED FORECAST CAPITAL EXPENDITURE

- 2.1 Figure 1 shows DBP's annual forecast of conforming capital expenditure for the AA Period that was included in the Proposed Revised AAI.
- 2.2 All conforming capital expenditure planned for the AA Period is intended to be incurred in connection with non-expansion or stay in business (**SIB**) type projects.

**Figure 1: Proposed forecast capital expenditure 2016 to 2020**



- 2.3 Table 1 allocates the proposed forecast conforming capital expenditure for each year into the asset classes used in the depreciation schedule of the Proposed Revised AAI.

**Table 1: Proposed forecast SIB capital expenditure by asset class (Real \$m as at 31 December 2015)**

	2016	2017	2018	2019	2020
Pipeline	3.67	2.48	1.63	5.33	7.55
Compression	13.61	13.97	12.44	11.65	11.59
Metering	3.60	2.68	0.85	0.64	3.10
Other	2.39	2.64	2.58	1.75	2.52
<b>Total (Real)</b>	<b>23.27</b>	<b>21.77</b>	<b>17.50</b>	<b>19.37</b>	<b>24.76</b>

- 2.4 Sections 5 and 6 of this submission contain all of the projects that make up the annual conforming capital expenditure forecasts and a justification of each such project against the criteria outlined in NGR 79 for capital expenditure to be conforming capital expenditure (**NGR 79 Criteria**). Firstly, Section 5 lists each project and the forecast expenditure and asset class for each project. Section 6 then contains each project's description and justification against the criteria under NGR 79(2).

### 3. CAPITAL EXPENDITURE CRITERIA

- 3.1 One of the building blocks to be used to determine the Total Revenue for each year of an access arrangement period is the return on the projected capital base (see NGR 76(a)) in that year.
- 3.2 One of the elements used to determine the projected capital base for the year is to determine the forecast capital expenditure. NGR 78(b) provides that forecast conforming capital expenditure for a period is to be added to the opening capital base for the period as part of the process of determining the projected capital base for that period.
- 3.3 The criteria to be met for forecast expenditure to be approved by a regulator as forecast conforming capital expenditure are the same as those for capital expenditure that has been made.
- 3.4 That criteria are outlined in NGR 79 (**NGR 79 Criteria**) and are:
  - (a) the capital expenditure must be such as would be incurred by a prudent service provider acting efficiently, in accordance with accepted good industry practice, to achieve the lowest sustainable cost of providing services;
  - (b) the capital expenditure must be justifiable on a ground stated in subrule (2).
- 3.5 The grounds outlined in NGR 79(2) are:
  - (a) the overall economic value of the expenditure is positive. It is noted that, in addition to the considerations outlined in NGR 79(3) to be taken into account to determine whether the overall economic value of expenditure is positive, Schedule 1, clause 7(2) of the NGR provides that the ERA must consider material economic value that is likely to accrue directly to electricity market participants and end users of electricity from additional gas fired generation capacity; or
  - (b) the present value of the expected incremental revenue to be generated as a result of the expenditure exceeds the present value of the capital expenditure; or
  - (c) the capital expenditure is necessary:
    - (i) to maintain and improve the safety of services; or
    - (ii) to maintain the integrity of services; or
    - (iii) to comply with a regulatory obligation or requirement; or
    - (iv) to maintain the service provider's capacity to meet levels of demand for services existing at the time the capital expenditure is incurred (as distinct from projected demand that is dependent on an expansion of pipeline capacity); or
  - (d) if the capital expenditure is an aggregate amount divisible into 2 parts, one referable to incremental services and the other referable to a purpose referred to in paragraph (c), and the former is justifiable under paragraph (b) and the latter under paragraph (c).
- 3.6 NGR 71(1) provides (relevantly) that in determining whether capital expenditure is efficient and complies with other criteria prescribed by the NGR, the ERA may, without embarking on a detailed investigation, infer compliance from the operation of an incentive mechanism or on any other basis the ERA considers appropriate.
- 3.7 The remaining paragraphs in this section of the submission outline DBP's interpretation of key terms used in NGR 79.



## Regulator's discretion

- 3.8 It is important to note that in assessing whether the capital expenditure is conforming capital expenditure the ERA has a limited discretion.<sup>1</sup>
- 3.9 As provided for in NGR 40(2), this means that the ERA may not withhold its approval to capital expenditure as conforming capital expenditure if the ERA is satisfied that it complies with the applicable requirements of the NGL and is consistent with applicable criteria (if any) prescribed by the NGR.
- 3.10 The effect of this is that the ERA can only withhold its approval if the element is outside the range of acceptable alternatives that comply with the requirements relevant to this element. If the ERA considers that a change to the relevant element might be desirable to achieve more complete conformity between the element and the principles and objectives of the NGA, it is not allowed to reject the service provider's proposal to give effect to that view in the decision making process.

## Prudency

- 3.11 Under NGR 79(1)(a), the capital expenditure must be such as would be incurred by a prudent service provider acting efficiently, in accordance with accepted good industry practice, to achieve the lowest sustainable cost of providing services.
- 3.12 In deciding whether expenditure is prudent, case law and regulatory precedent indicates that the regulator must ask what would a reasonable board of directors and company management have decided given what they knew or reasonably should have known to be true and the time they made a decision. In making decisions, a utility must take into account the best interests of its customers, whilst still being entitled to a fair return.
- 3.13 This was the test was applied by the Washington Utilities and Transportation Commission hearing in relation to Puget Sound Power & Light Company in the Fourth Supplemental Order made in cause U-83-54 in September 1984 at pp 32, 33, where the Commission said:
- "The test this Commission applies to measure prudence is what would a reasonable board of directors and company management have decided given what they knew or reasonably should have known to be true at the time they made a decision. This test applies both to the question of need and the appropriateness of expenditures."*
- 3.14 In Canada, the issue was considered at length in a decision of the Alberta Court of Appeal, Atco Gas & Pipeline Ltd v Alberta (Energy & Utilities Board) [2005] AJ 495, 2005 ABCA 122.
- 3.15 In its decision, the Board applied the following test of prudence:
- (a) the utility would be found prudent if it exercises good judgment and makes decisions which are reasonable at the time they are made, based on information that the owner of the utility knew or ought to have known at the time the decision was made;
  - (b) in making a decision, a utility must take into account the best interest of its customers while still being entitled to a fair return.
- 3.16 It is noted that Webster's New 20th Century Dictionary of the English language definition of prudent, provides as follows:
- (a) capable of exercising sound judgment in practical matters; cautious or discreet in conduct; circumspect; sensible; not rash; characterised, dictated, or directed by prudence; as, prudent measures,
  - (b) synonyms include, circumspect, discreet, cautious, judicious, careful, considerate, sagacious, thoughtful, provident, frugal and economical.

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<sup>1</sup> NGR 79(6)

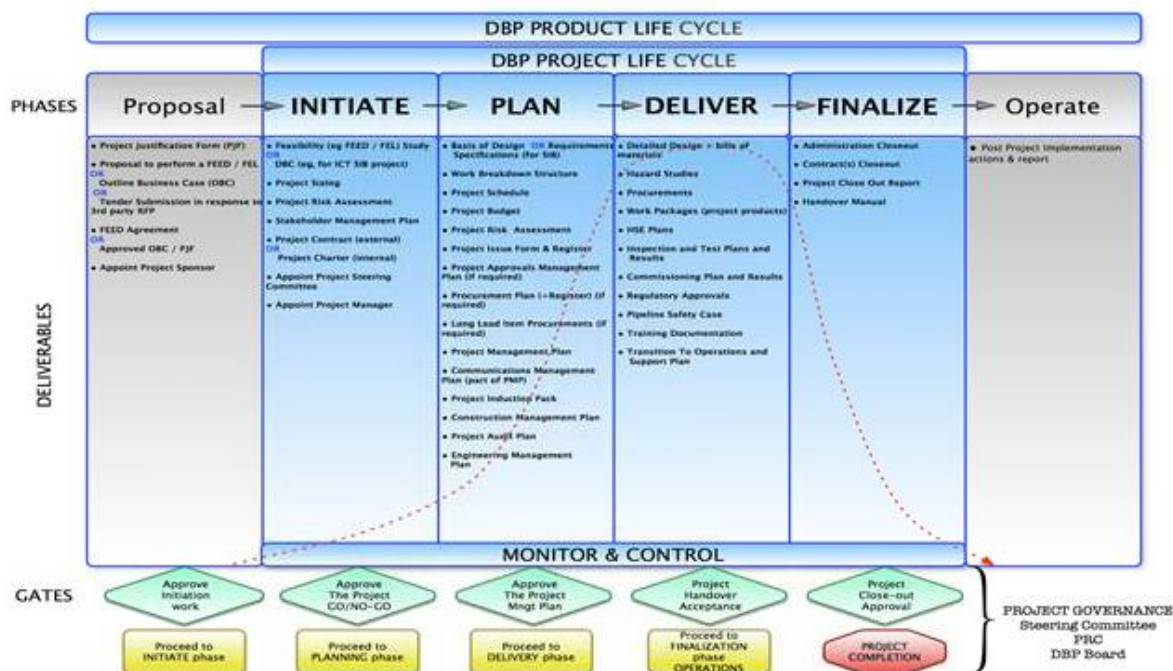
- 3.17 The concept of prudence is therefore used to determine whether, at a particular time in question, an arrangement is or was appropriate and reasonable given the circumstances known or which ought to have been known.
- 3.18 The case law has also made it clear that an assessment of whether expenditure is prudence ought not to be based on hindsight. Webster's Dictionary defines hindsight as "perception of nature and demands of an event after it has happened". Applying this definition to the current context, the regulator must not impute knowledge to the service provider that the service provider could not reasonably have known at the time the utility made the decision being reviewed.
- 3.19 In deciding whether this test is met to be able to conclude whether expenditure is prudent, case law indicates that there is a presumption that expenditure by a service provider is prudent and that the regulator has the burden of proof to demonstrate that expenditure is imprudent. Every investment may be assumed to have been made in the exercise of reasonable judgment, unless the contrary is shown. There should not be excluded from the finding of prudence, investments which, under ordinary circumstances, would be deemed reasonable. Unless the Regulator can find expenditure which is dishonest or obviously wasteful or imprudent expenditure, it will be assumed to be prudent.
- 3.20 It is submitted that if the following practical steps can be shown, then prudence and reasonableness in relation to expenditure will be proven:
- (a) *Planning* - the ability to demonstrate that the service provider has considered an appropriate range of project contractual options given the legal and regulatory requirements and environment. The service provider should show that it has organised resources and developed policies and procedures to define clearly responsibilities and accountability.
  - (b) *Prioritise* - demonstrate that risk exposure areas have been identified, contingency plans developed for problems and flexibility maintained to adapt to changing project conditions.
  - (c) *Management* - demonstrate that a framework has been developed for the effective management of the project using resources, tools and reporting requirements, including timely corrective action when required.
  - (d) *Collaboration* - demonstrate that key stakeholders have been involved early in the process. Demonstrate the need for the project and that mechanisms are in place to monitor project conditions and take corrective action as they arise.
  - (e) *Documentation* - recognise the need to document all decisions and supporting rationales for actions throughout the planning and project process. This demonstrates that the utility has acted reasonably in preparing for and executing a major project.
- 3.21 Examples of evidence of imprudence include:
- (a) poorly structured contracts not matched to project needs and the resource capabilities of the utility or the contractor;
  - (b) failure of effectively organised owner supervision;
  - (c) over-reliance on contracts and litigation to remedy problems after the fact, rather than through proper contract administration;
  - (d) inadequate financial planning and financial resources to match project needs;
  - (e) lack of information to make informed decisions, including inadequate cost, schedule, quality or regulatory compliance information;
  - (f) poor and slow resolution of engineering problems; and
  - (g) inability to bring the project to a conclusion and for the owner to accept operational responsibility.
- 3.22 In this regard, reference is made to the governance and cost control arrangements outlined in Submission 2 filed on or about the date of this submission.

- 3.23 Based on the information contained in Submission 2 and in section 4 of this submission, DBP submits that the ERA should not only infer compliance with the prudency requirements of the criteria in NGR 79 but accept that each item of forecast expenditure meets the prudency criterion of the NGR 79 Criteria. This is so for the following reasons:
- (a) *Planning* - DBP has considered an appropriate range of project contractual options given the legal and regulatory requirements and environment. Furthermore it has organised resources and developed policies and procedures to define clearly responsibilities and accountability. In this regard
  - (b) *Prioritise* - through the stay in business planning process, DBP has demonstrated that risk exposure areas have been identified, contingency plans developed for problems and flexibility maintained to adapt to changing project conditions.
  - (c) *Management* - the governance arrangements outlined in submission 2 demonstrate that a framework is in place for the effective management of the project using resources, tools and reporting requirements, including timely corrective action when required.
  - (d) *Collaboration* - key stakeholders have been involved early in the process. DBP has also demonstrated the need for the project and that mechanisms are in place to monitor project conditions and take corrective action as they arise.
  - (e) *Documentation* - DBP has demonstrated that it documents all decisions and supporting rationales for actions throughout the planning and project process.

## 4. PRUDENCY & EFFICIENCY OF PROPOSED FORECAST CAPITAL EXPENDITURE

- 4.1 NGR 79(1)(a) requires that conforming capital expenditure must be incurred by a prudent service provider acting efficiently, in accordance with accepted good industry practice, to achieve the lowest sustainable cost of providing service (**Prudency & Efficiency Criterion**).
- 4.2 DBP submits that the Prudency & Efficiency Criterion is met for each of the projects that make up the forecast conforming capital expenditure in the Proposed Revised AAI. This is so for a number of reasons.
- 4.3 Firstly, as outlined in Submission 2, DBP has developed a project management methodology that is to apply to every phase of the life of every capital project within the business, including the proposal, initiate, planning, delivering and finalisation phases. This common methodology:
- establishes consistency which in turn creates higher project productivity and reduces re-work and mistakes;
  - provides a foundation and base-lines for continuous improvement;
  - creates opportunities for greater visibility of project performance by senior management, and stronger integration of project activities and outcomes across all divisions that are required to provide support to a project (eg, the maintenance and operations division, the corporate services, finance and commercial divisions).
- 4.4 The project management methodology stipulates certain deliverables for each phase of a project and the governance arrangements in place. It has been pictorially summarised in Figure 2 below.

Figure 2: Overview of DBP's Project Management Methodology



- 4.5 A series of procedures, templates, and supporting information and tools have been developed to ensure that the deliverables outlined above for each phase of a project can be achieved. Figure 3 lists the relevant procedures that are to apply to each phase of the project's life.

Figure 3: Project Management Procedures

Proposal	Initiation	Planning	Delivery	Finalization	Operation	
Terminology Guide	Terminology Guide	Terminology Guide	Terminology Guide	Terminology Guide	Terminology Guide	
PMM Overview	PMM Overview	PMM Overview	PMM Overview	PMM Overview	Project Closure	
Project Sizing	Project Sizing	Project Change Management	Project Change Management	Project Change Management		
	Project Scope Definition	Project Management Plan	Project Scope Definition	Project Closure		
	Project Reporting	Project Scope Definition	Project Schedule Development and Control	Project Auditing		
	Project Risk Management		Project Schedule Development and Control	Project Cost Management	Project Reporting	
			Project Cost Management	Project Auditing	Project Risk Management	
			Project Auditing	Project Reporting		
			Project Reporting	Project Risk Management		
			Project Risk Management			

4.6 A copy of the Project Management Methodology Overview Procedure is attached as Appendix A: Importantly, the procedure provides that the Project Management Methodology is designed to provide:

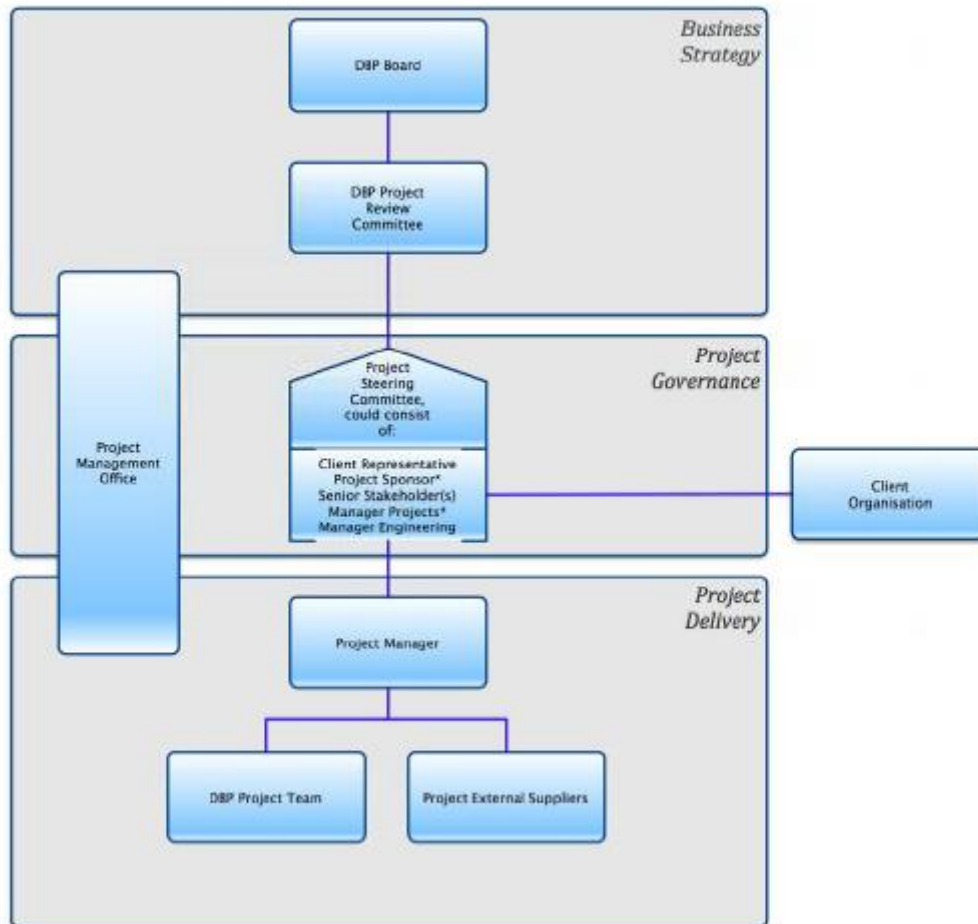
- (a) project managers and other project participants with a process to ensure that projects are executed consistently in a manner that represents industry best practice;
- (b) direction and assistance on the key areas of project management that need to be applied consistently to project initiation, planning, delivery and finalisation phases.
- (c) the project team with a program of persistent, consistent, accurate and timely information and processes.

4.7 The procedure also outlines the following key factors in achieving consistent levels of project quality and DBP's requirements for each of the factors:

- (a) Integration Management - this covers:
  - (i) integration of the various elements of project controls (estimating, progress, cost, schedule, resources, materials, document management, change controls, risk and issues management and project management information);
  - (ii) accurate and timely cost and progress measurement and forecasting to facilitate prudent management decisions;
  - (iii) controlled and visible management of change;
  - (iv) a seamless transition across Project phases; and
  - (v) use of proven systems that are sufficiently flexible to accommodate project needs.
- (b) Scope Management - this covers:
  - (i) clear and complete definition of scope, costs and responsibilities using a comprehensive cost breakdown structures. The scope of work needs to be clearly defined in sufficient detail such that the technical and financial aims of the project are fully understood and accepted by the project team.
- (c) Time Management - this covers clear resourcing allocations to the project schedule, and clear relationships between the schedule and the cost breakdown structure.

- (d) Cost Management - this covers clear, transparent and accurate planning, estimating, budgeting, and controlling of project cost so that the project can be completed within the approved budget, and the position at any time is known and can be substantiated.
  - (e) Quality Management - this covers adherence to processes that ensure the result of a project meets the needs for which the project was executed. Processes such as quality planning, assurance, and control are included in this area.
  - (f) Communications Management - this covers the establishment of standards for cost and schedule reporting, monitoring and forecasting based on the cost breakdown structures which ensure uniform, meaningful and consistent reporting.
  - (g) Risk Management - this covers controlled visible management of risks and issues.
  - (h) Procurement Management - this covers clear, accurate and visible management of project materials and ensures well formed, unambiguous and consistent procurements.
  - (i) HSE and Regulatory Management - this covers well defined project interfaces to HSE and Regulatory processes and organisations.
- 4.8 In terms of the governance arrangements, ultimate responsibility and accountability for any project must be clearly defined and accepted at an appropriate level of authority within DBP. The management structure for a project must be established that identifies the specific stakeholders, their responsibilities, accountabilities and the interaction between them throughout the project.
- 4.9 Accordingly, a governance management structure has been developed which is pictorially summarised in Figure 4 below. The key stakeholders in that structure, and the role they play, are summarised below:
- (a) The Project Review Committee (PRC) - the PRC is comprised of the senior executive team which determines the priority of DBP's portfolio of projects in the context of the DBP business plan and budget. The PRC operates according to a charter and provides authority to a project steering committee for the delivery of a project.
  - (b) Project Steering Committee - all projects are required to have a Project Steering Committee which is to have final responsibility for project delivery. The composition of the Steering Committee can and will vary from project to project. It should always include the Project Sponsor, and a suitable authorised person to approve project governance decisions. For most projects, this will be the Manager, Projects. For Construction projects, the Steering Committee may also include the Manager Engineering.
  - (c) DBP's customers may choose to implement a project Steering Committee as a part of their project execution function and if this is the case, the chair of the DBP Project Steering Committee will be part of, and report to, the customer's steering committee for the project.
  - (d) Depending upon the requirements of the project, project governance structures may vary depending upon the needs of the project. A project sizing procedure has been developed which provides the appropriate guidance for the structure required depending upon a project's size. Importantly, the number and nature of roles involved in project governance and for the project delivery team for a particular project will be agreed and documented at the project kickoff meeting and sanctioned by project governance at the Gate Meeting which occurs at the end of Initiation and beginning of Planning.

Figure 4: DBP Project Governance Structure



4.10 In addition DBP requires the use of an RASCI (Responsible, Accountable, Support, Consulted and Informed) Matrix to define the participation by various roles in the completion of tasks or deliverables for a project. RASCI is an abbreviation for:

- (a) Responsible – those who do the work to achieve the task
- (b) Accountable – those who are ultimately accountable for the correct and thorough completion of the deliverable or task, and the one to whom Responsible is accountable.
- (c) Support – these are resources allocated to Responsible. Support will assist in completing the task.
- (d) To be Consulted – those whose inputs are sought, and with whom there is two-way communications
- (e) To be Informed – those who are kept up-to-date on progress, often only on completion of the task or deliverable.

4.11 In constructing the RASCI matrix for a project, the following principles are applied:

- (a) Aim to place Accountability (A) and Responsibility I at levels that are closest to the project work or knowledge
- (b) Only one (1) Accountability per task or deliverable
- (c) Authority must accompany accountability

4.12 The standard RASCI matrix for DBP Project Governance is shown in below.

Figure 5: RASCI matrix

Key Activity / Milestone	Client	Project Review Committee	Project Steering Committee	Project Manager	Project Team
Feasibility Agreement	A	C	R	I	—
Project Business Case (FEED or DBC) – project scope & approach	C	C	A	R	S
Endorsement of the Project Business Case (FEED or DBC)	A	C	R	I	I
Project Management Plan	C	C	A	R	S
Project Quality Plan	C	A	R	R	R
Project Schedule	I	—	A	R	S
Project Budget	I	I	A	R	S
Detailed Design	I	—	A	R	S
Change Requests	I	I	A	R	S

Key Activity / Milestone	Client	Project Review Committee	Project Steering Committee	Project Manager	Project Team
Change Approvals	A	C	R	I	I
Project Baselines	I	—	A	R	S
Project Status Reports	I	I	A	R	S
Project Issue and Risk Escalations (corrective action recommendations, preventative action recommendations)	C	C	A	R	S
Project Milestone Review (PMM milestones) – as per GATES in section Figure 1 - DBP Project Lifecycle	I	I	A	R	S
Project Closeout Report	—	I	A	R	S
Project Handover Acceptance	A	I	R	S	S
Post Implementation Review	I	A	R	—	—
Financial approval	A	C	R	S	I
Regulatory Interface	A	I	R	S	S

- 4.13 In addition to the management governance structure outlined above, DBP has also implemented a "Gate Station" structure which outlines what must be completed by each phase of a project. The Gate Stations are:



- (a) Gate 1 – Commence Definition. At this stage, the project is authorised by the PRC to complete the Initiation Phase within the approved initiation phase funds. This could include approval to purchase long lead items.
  - (b) Gate 2 – Business Case. At this phase, the project is authorised by the PRC to complete the Planning Phase within approved planning phase funds and with a formed Project Steering Committee.
  - (c) Gate 3 – Project Management Plan. At this stage, a project management plan is approved by the Project Steering Committee (PSC) which contains the authority to complete the delivery phase within approved delivery phase funds according to the approved plan.
  - (d) Gate 4 – Acceptance. At this stage acceptance of the project deliverables occurs. The project is authorised by the PSC to complete the finalisation phase with approved finalisation phase funds.
  - (e) Gate 5 – Closeout. Acceptance of the closeout of the Project occurs at this phase.
- 4.14 From a reporting perspective, the following reports are required to be provided in relation to each project:
- (a) Daily Construction Report
  - (b) Weekly / Monthly - Status, Construction Reports
  - (c) Change Request, Technical Query, Variation Request
  - (d) Consolidated Projects Status Report
  - (e) Gate Certificates for each Gate Station referred to above
  - (f) Hand-over Certificate
  - (g) Closeout Report
- 4.15 In addition to the above information, DBP submits that all forecast capital expenditure outlined in in Table 1 meets the Prudency & Efficiency Criterion in NGR 79(1)(a) for the following additional reasons:
- (a) For the reasons outlined in paragraph 3.23 of this submission;
  - (b) DBP has a SIB planning process that includes project identification informed by DBP's business processes and Asset management strategy framework, detailed risk assessment and ranking process (see Section 4 of Submission 2);
  - (c) The SIB planning process has adequate governance oversight from the Project Review Committee to the DBP Board and unitholders (See Section 3 of Submission 2);
  - (d) DBP uses front end engineering design (FEED) studies which involve a needs assessment for proposed works, identification and investigation of options available to meet the functional;
- 
- (f) The terms and conditions in the Standard Shipper Contract (SSC) that have a commercially negotiated tariff, also provide a commercial incentive for DBP to be prudent and efficient in its capital planning and expenditure. Previously the ERA has noted that these incentives may be stronger than those under the regulatory framework<sup>2</sup>. In the 2016-20 Access Arrangement Period, approximately 85% of DBP's revenue will be contracted with a negotiated tariff. The prevailing tariff is fixed with the exceptions of:
    - (i) Escalation for inflation;
    - (ii) Changes in taxation;

<sup>2</sup> ERA Draft Decision (May 2010) paragraph 194-197.

- (iii) Election to provide system use gas; and
- (iv) Adjustments in respect of certain amounts of expansion capital expenditure.

## 5. FORECAST CAPITAL EXPENDITURE BY PROJECT

5.1 The following table outlines all of the projects which make up the proposed forecast capital expenditure programme for the AA Period.

**Table 2: Table of Stay in Business Capital Expenditure Projects (Nominal \$)**

Table	Project Title	Cat.	2016	2017	2018	2019	2020
Table 3	Gas chromatograph upgrade	Meter					
Table 4	Repair of corroded horizontal IG joints at Alcoa Pinjarra and Wagerup	Meter					
Table 5	Upgrade odorant injection facilities	Meter					
Table 6	Installation of Working at Heights access facilities	Comp.					
Table 7	Installation of permanent work platforms and stairways for access to heights at CCVT sites	Pipe.					
Table 8	Provision for Health & Safety projects	Other					
Table 9	Installation of RCD protection devices	Comp.					
Table 10	Upgrade of SCADA communications MLV7-MLV118	Pipe.					
Table 11	Upgrade of southern communications network from MLV117 to Clifton Road	Pipe.					
Table 12	Relocation of Northern communication hut batteries	Pipe.					
Table 13	Upgrade of flow computers	Meter					
Table 14	Provision for subsequent costs	Meter					
Table 15	Upgrade of Coriolis meters	Meter					
Table 16	Provision for subsequent costs - EOP	Other					
Table 17	Provision for Subsequent Costs	Comp.					
	Provision for	Pipe.					

Table	Project Title	Cat.	2016	2017	2018	2019	2020
Table 18	subsequent costs						
Table 19	Provision for projects initiated under management of change process	Other					
Table 20	Annual allocation for vehicle fleet replacement programme	Other					
Table 21	Intelligent pigging	Pipe.					
Table 22	Upgrade of station and unit F&G monitoring system	Comp.					
Table 23	Retrofitting of fire suppression at compressor stations	Comp.					
Table 24	Implementation of DBNGP CP Dig-up Programme	Pipe.					
Table 25	Refurbishment of below and above ground pipework	Comp					
Table 26	Painting of meter stations	Meter					
Table 27	Implementation of new Financial Management System	Other					
Table 28	Replacement of earthing systems	Comp.					
Table 29	Replacement of earthing systems	Meter					
Table 30	Rectifications of hazardous area equipment installations	Comp.					
Table 31	Inspection of hazardous areas	Comp.					
Table 32	Software modification for NP Turbine compressor units at CS6/2 and CS9/1	Comp.					
Table 33	Software modification for Solar Turbine-compressor Units on DBNGP	Comp.					
Table 34	Solar & GE Windows XP based HMI upgrade	Comp.					
Table 35	Upgrade of PLC at compressor stations	Comp.					
Table 36	Upgrade of fire and gas	Pipe.					

Table	Project Title	Cat.	2016	2017	2018	2019	2020
	equipment at MLV and meter stations						
Table 37	Annual provision for IT items	Other					
Table 38	CRS	Other					
Table 39	Production of safety key site drawings	Comp.					
Table 40	Replacement of reverse osmosis units	Comp.					
Table 41	Replacement of wall and roof sheeting for communications and GEA huts at repeater sites	Pipe.					
Table 42	Inspection of Nuovo Pignone unit hot gas path at CS6	Comp.					
Table 43	Replacement of D2 with D4 wheels	Comp.					
Table 44	Replacement of air conditioning at compressor stations	Comp.					
Table 45	24VDC batteries and charger replacement	Comp.					
Table 46	Replacement of 110V DC batteries and battery chargers	Comp.					
Table 47	Upgrade of GEA & DEA controls at CS1 to 8 (as per power controllability scope)	Comp.					
Table 48	CS1-CS9 power systems rationalisation	Comp.					
Table 49	Replacement of unit control systems at CS2/2, CS4/2 and CS7/2	Comp.					
Table 50	Replacement of concrete supports	Comp.					
Table 51	Jandakot workshop tools	Other					
Table 52	SDO tools	Other					
Table 53	6 X 4 tipper, tag trailer & skid steer loader	Other					
Table 54	Installation of soft start modifications to aftercooler MCC at all compressor stations.	Comp.					

Table	Project Title	Cat.	2016	2017	2018	2019	2020
Table 55	Field technical services tools	Other					
Table 56	Maintenance tools	Other					
Table 57	Refurbishment of accommodation facilities	Comp.					
Table 58	Upgrade of communications Exmouth meter station	Pipe.					
Table 59	Upgrade of communications Maitland meter station	Pipe.					
Table 60	Upgrade of communications system at Mungarra meter station	Meter					
Table 61	Upgrade of communications system at Pinjar meter station	Meter					
Table 62	Installation of traffic management at CS6	Comp.					
Table 63	Load banks cable replacement	Comp.					
Table 64	Upgrade of solar panels at spur sites 1 to 6	Pipe.					
Table 65	Upgrade of GEA 1 & 2 TEM panel at compressor stations.	Comp.					
Table 66	Replacement of Stage 3A Turbine air inlet filters at CS4/2	Comp.					
Table 67	Replacement of air compressors at compressor stations	Comp.					
Table 68	CS10/3 Exhaust expansion joint replacement	Comp.					
Table 69	Procurement, installation and commissioning of 4KW CCVT at MLV8	Pipe.					
Table 70	Replacement of labyrinth seals with mechanical seals on all Nuova Pignone units at CS6 and CS9	Comp.					
Table 71	Upgrade of gas turbine fuel gas pressure control system (from pneumatic to electronic control).	Comp.					

Table	Project Title	Cat.	2016	2017	2018	2019	2020
Table 72	Installation of Solar Dynamic Vibration Data Visibility program	Comp.					
Table 73	Provision of condition monitoring data visibility	Comp.					
Table 74	Office 2013	Other					
Table 75	Workstation managed operating environment	Other					
Table 76	Windows 8.1 desktop upgrade	Other					
Table 77	HSE intranet enhancements	Other					
Table 78	Upgrade of Maximo	Other					
Table 79	Purchase of additional hardware and software for field interface equipment	Other					
Table 80	Installation of additional power gas isolation valves for all MLVs	Pipe.					
Table 81	Modification of instrument gas supply to the MLVL actuators	Pipe.					
Table 82	Relocation of Jandakot gas engine alternator	Other					
Table 83	Replacement of fuel gas valve hydraulic actuators with electric actuators for all Nuovo Pignone units	Comp.					
Table 84	Electrical isolation of all LM500	Comp.					
Table 85	Modifications of metering on M2A meter runs	Meter					
Table 86	Installation of diesel fuel filters at bulk diesel storage tanks	Comp.					
Table 87	Installation of air conditioning in PAV huts	Pipe.					
Table 88	Installation of remote monitoring & diagnostics for Nuovo Pignone units	Comp.					
Table 89	Repair and replacement of exhaust system at CS6/2	Comp.					
Table 90	Alarm management for	Comp.					

Table	Project Title	Cat.	2016	2017	2018	2019	2020
	compressor stations						
Table 91	Conversion of Logic Master program into Proficy of remaining GE PLC	Comp.					
Table 92	Purchase of 8-10T flatbed 4WD truck with 10T Hiab crane	Other					
Table 93	Nuovo Pignone boost compressor maintenance container	Comp					
Table 94	Purchase of manitou for compressor facility	Comp.					
Table 95	Upgrade of video conferencing	Other					
Table 96	Provision of video conferencing at CS2, CS4, CS6, CS7, CS8	Other					
Table 97	Mipela GeoSolutions: X-Info Suite OnSite Implementation	Other					
Table 98	Repair workshop instrument clean room	Other					
Table 99	Sealing of airstrip and installation of runway lighting compressor stations	Comp.					
Table 100	Replacement of sacrificial anode bed on Worsley lateral	Pipe.					
Table 101	New Compressor Station Accommodation	Comp.					
Table 102	Replacement of earthing systems at mainline Valve and repeater sites	Pipe.					
Table 104	Upgrade of water bath heater pipework	Comp					
Table 104	Retrofitting Remote Isolation Valves	Meter					
	<b>Total (Nominal)</b>		<b>23,744,927</b>	<b>22,672,740</b>	<b>18,618,000</b>	<b>21,072,000</b>	<b>27,547,500</b>



## 6. PROJECT JUSTIFICATION

6.1 The following tables in this section 6 contain the following information in relation to each of the projects in Table 2(provided in section 5):

- (a) A description of the scope of work for the project.
- (b) The justification or business need for the project.
- (c) The total forecast conforming expenditure and its timing.
- (d) Which of the NGR 79 Criteria are met to make it conforming capital expenditure.

6.2 It should be noted that expenditure is provided on a nominal basis.

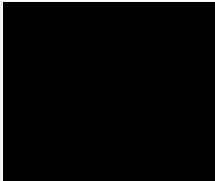
**Table 3: Gas chromatograph upgrade**

	Project Details
<b>Scope of work</b>	Seven ABB C6+ BTU8000 chromatographs will be replaced with the current technology ABB C6+ NGC8206 Gas Chromatograph. This replacement is effectively a new for old replacement.
<b>Justification / business need</b>	This project is required for the following reasons: <ul style="list-style-type: none"> <li>• ABB C6+ BTU8100 gas chromatographs have reached their end of life;</li> <li>• Spare parts for currently installed equipment are unavailable for purchase;</li> <li>• The seven units identified are required as part of the design basis for system wide gas quality data requirements.</li> </ul>
<b>Expenditure</b>	
<b>NGR Criteria</b>	In accordance with NGR 79 (2)(c) the capital expenditure is necessary: <ul style="list-style-type: none"> <li>• to maintain the integrity of services.</li> <li>• to maintain DBP's capacity to meet levels of demand for services existing at the time the capital expenditure is incurred.</li> </ul>

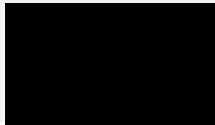
**Table 4: Proposal for repair of corroded horizontal IG joints at Alcoa Pinjarra and Wagerup**

	Project Details
<b>Scope of work</b>	There is a need to repair flanges to improve their integrity due to excessive corrosion on the meter station inlet insulation flanges at both the Alcoa Pinjarra & Wagerup meter stations.  Inspections undertaken by DBP's corrosion engineer at both sites reveal that there is significant corrosion in the horizontal insulation gaskets (IG) joints at delivery lines. The flange gap is full of corrosion product and detached paint flakes.  DBP assesses the safest solution is to renovate corroded joints and maintain IG in the line, hot tap and bypass for uninterrupted gas supply to both delivery lines. The project will include detailed FEED study to design a system of filtration downstream of hot tap to eliminate swarf entering shipper installations.
<b>Justification / business need</b>	Renovation of the flange joints is the only solution that maintains the integrity of the delivery point and prevents future gas leak. There is no practical solution to seal the flange joint externally using mechanical clamp without compromising the CP system. No action may result in unplanned shutdown and unavailability of supply due to deferred maintenance.
<b>Expenditure</b>	
<b>NGR Criteria</b>	In accordance with NGR 79 (2)(c) the capital expenditure is necessary: <ul style="list-style-type: none"> <li>• to maintain and improve the safety of services.</li> <li>• to maintain the integrity of services.</li> </ul>

**Table 5: Upgrade odorant injection facilities**

	Project Details
<b>Scope of work</b>	Pressure safety equipment on odorant pressure equipment has reached the end of life and requires replacement as per Australian Standards.
<b>Justification / business need</b>	Replacing this equipment is required to remain compliant with Australian Standards. The new design determined by a HAZOP (DBP's internal risk assessment process) also incorporates additional valving arrangements to ensure exposure to odorant (a dangerous substance at concentration) is minimised.
<b>Expenditure</b>	
<b>NGR Criteria</b>	In accordance with NGR 79 (2)(c) the capital expenditure is necessary: <ul style="list-style-type: none"> <li>to maintain and improve the safety of services.</li> <li>to comply with a regulatory obligation or requirement.</li> </ul>

**Table 6: Installation of working at heights access facilities**

	Project Details
<b>Scope of work</b>	The working at heights project will deliver compliance with all relevant occupational health and safety legislation and Australian Standards. This is an ongoing project that selects a scope each year on a risk based prioritisation. For example, the practice of working on aftercoolers has been ranked highly due to the combination of significant height with confined space, and involves execution of a rescue plan from height. New platforms have been designed for DAVIT rescue equipment and these will be fabricated and installed at CS09, CS06 and Dampier Facilities. In addition, prefabrication of platform railing extensions and access improvements to suit WLPG and CS09 odorant storage facilities including installation will be included.
<b>Justification / business need</b>	The key benefit resulting from this project is to ensure access and egress of above ground facility on the DBNGP is compliant with OHS regulations and Australian Standards.
<b>Expenditure</b>	
<b>NGR Criteria</b>	In accordance with NGR 79 (2)(c) the capital expenditure is necessary: <ul style="list-style-type: none"> <li>to maintain and improve the safety of services.</li> <li>to comply with a regulatory obligation or requirement.</li> </ul>

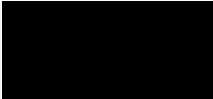
**Table 7: Installation of permanent work platforms and stairways at CCVT sites**

	Project Details
<b>Scope of work</b>	<p>The project objective is to manufacture and install permanent access to the 4kW closed circuit vapour turbine (CCVT) roof on type "A" MLV sites. New CCVT units were installed as part of a previous upgrade project, however access for maintenance was not incorporated into the design. The new units have been installed from MLV008 to MLV079.</p> <p>These units have experienced several failures and the cost of erecting scaffolding at this height is significant. Access to the roof is also required annually for routine maintenance which currently can only be safely performed with scaffolding.</p> <p>The scope of this project is to measure, design, prefabricate and install access method and platforms, including handrails in the elevated working area on the roof of the CCVT. There are 19 sites in total which are broken down into a two staged project; 9 sites in the first year and 10 in the following year.</p> <p>This project is a multi-year project, forecast expenditure required to complete project.</p>
<b>Justification / business need</b>	<p>A method of maintenance that involves a Working at heights certificate requires a 2 man crew, additional planning and additional equipment. The ongoing labour requirements for these works will be halved with adequate access.</p>
<b>Expenditure</b>	
<b>NGR Criteria</b>	<p>In accordance with NGR 79 (2)(c) the capital expenditure is necessary:</p> <ul style="list-style-type: none"> <li>to maintain and improve the safety of services.</li> <li>to comply with a regulatory obligation or requirement.</li> </ul>

**Table 8: Provision for health & safety projects**

	Project Details
<b>Scope of work</b>	<p>This project is to provide sufficient capital funding for improvement projects that are being developed by the HSE representatives across DBP's business to manage actions arising out of DBP's annual Safety Survey. As the projects are still being assessed and developed by the DBP Safety Committees, it is prudent that a holding provision is set aside that will be made available to support individual projects when they are defined sufficiently for implementation.</p>
<b>Justification / business need</b>	<p>Business needs will be driven specifically by each improvement project directly linked to issues raised in the Safety Survey including success factors that will be monitored to ensure funds are properly utilised.</p> <p>The improvement programmes are categorised under the following focus areas in the Safety Survey: Response to Safety, Continuous Improvement, Safety Leadership, Psychological Safety and Engagement</p> <p>It is expected that each improvement project under these headings will have detailed business justifications.</p>
<b>Expenditure</b>	
<b>NGR Criteria</b>	<p>In accordance with NGR 79 (2)(c) the capital expenditure is necessary:</p> <ul style="list-style-type: none"> <li>to maintain and improve the safety of services.</li> <li>to maintain the integrity of services.</li> <li>to comply with a regulatory obligation or requirement.</li> </ul>

**Table 9: Installation of RCD protection devices**

	Project Details
<b>Scope of work</b>	<p>The purpose of this project is to replace and retrofit Residual Circuit Breakers (RCD) for all compressor stations.</p> <p>It involves the installation and retrofitting of RCDs to all lights and power circuit requiring protection. The work to be completed in accordance with the FEED Study.</p> <p>All General Power Outlets (GPOs) that are not already RCD protected are to be retrofitted with RCD protection unless they have a 'dedicated purpose' such as a bore pump motor, or are required for critical infrastructure where nuisance tripping could be detrimental to operation such as for computer or information technology systems circuits and the reverse osmosis plant.</p> <p>Light circuits should only be retrofitted with RCD protection where there is likelihood that the light bulbs or fluorescent tubes will be replaced by a non-electrical worker. Furthermore, it is considered that there is no benefit in providing RCD protection for circuits such as the high bay lights in the turbine building which will only be worked on under a robust permit to work and isolation system.</p>
<b>Justification / business need</b>	<p>While DBP is not obliged to correct installations retrospectively, this issue was raised by DBP's maintenance safety committee as a concern, which initiated a FEED study.</p> <p>RCDs for a new electrical installation is required to comply with the Australian Wiring Rules defined in the Electricity (Licensing) Regulations 1991 (WA) which in turn is referenced in the Electricity Act 1945 (WA). Therefore, compliance with the Australian Wiring Rules is mandatory in Western Australia. In addition, compliance with the Australian Wiring Rules is a condition of DBP's pipeline licences and the Safety Case.</p>
<b>Expenditure</b>	
<b>NGR Criteria</b>	<p>In accordance with NGR 79 (2)(c) the capital expenditure is necessary:</p> <ul style="list-style-type: none"> <li>• to maintain and improve the safety of services.</li> <li>• to comply with a regulatory obligation or requirement.</li> </ul>

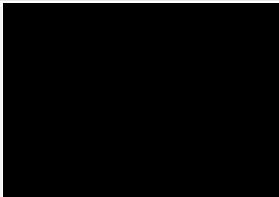
**Table 10: Upgrade of SCADA communications MLV007-MLV118**

	Project Details
<b>Scope of work</b>	Install serial communications at all sites between Perth and Karratha to provide fast and reliable SCADA communications.
<b>Justification / business need</b>	Currently the northern section SCADA communications are serviced by legacy 4 wire VF circuits. These circuits are then converted to RS232 serial utilising a modem at each site. The modems are old and unreliable. It is proposed to connect the communications system to the SCADA RTU directly using RS232 serial and to remove the requirement for modems.
<b>Expenditure</b>	
<b>NGR Criteria</b>	In accordance with NGR 79 (2)(c) the capital expenditure is necessary: <ul style="list-style-type: none"> <li>to maintain the integrity of services.</li> <li>to maintain DBP's capacity to meet levels of demand for services existing at the time the capital expenditure is incurred.</li> </ul>


**Table 11: Upgrade of southern communications network from MLV117 to Clifton Rd**

	Project Details
<b>Scope of work</b>	The scope of this project is as follows: <ul style="list-style-type: none"> <li>Upgrade and replacement of the DBNGP Southern Communications Network from MLV117.</li> <li>Upgrade and replace the DC power systems at MLV 117.</li> <li>Upgrading of the communications in the Kwinana industrial area to facilitate the exit from the Western Power pilot cable network.</li> <li>Upgrade of the communications to Compressor Station 10 to facilitate the existing from reliance on Telstra/WestNet services and also to increase capacity to this site.</li> <li>Upgrade communications at Pinjar Power Station and exit use of Western Power communications infrastructure.</li> <li>Upgrade communications at Mungarra Power Station and exit use of Western Power communications infrastructure.</li> <li>Consolidate backup communications paths between Perth and Karratha (SCADA, 2way, Telephone, Comms, Corporate).</li> </ul>
<b>Justification / business need</b>	Justification for the project as follows: <ul style="list-style-type: none"> <li>Southern Communications equipment is at end of life;</li> <li>DC power systems are at end of life;</li> <li>Exiting from the Western Power owned and operated pilot cable network;</li> <li>Cost savings by consolidating 3rd party provided backup communications circuits; and</li> <li>Failure to undertake this project will result is the loss of visibility and control of the DBNGP from MLV117 Della Road – MLV157 Clifton Road.</li> </ul>
<b>Expenditure</b>	
<b>NGR Criteria</b>	In accordance with NGR 79 (2)(c) the capital expenditure is necessary: <ul style="list-style-type: none"> <li>to maintain the integrity of services.</li> <li>to maintain DBP's capacity to meet levels of demand for services existing at the time the capital expenditure is incurred.</li> </ul>

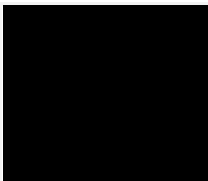
**Table 12: Relocation of northern communications hut batteries**

	Project Details
<b>Scope of work</b>	Replace and relocate communications repeater batteries from an external cabinet to new environmentally controlled cabinets located inside the communications hut. All 970 batteries in the 42 northern repeater sites will be replaced. This project will be carried out over 5 years with priority given to the most critical sites.
<b>Justification / business need</b>	Currently the northern section repeater sites batteries are experiencing failures and currently provide little to no backup power in times of a primary power failure. Batteries are located in external cabinets and have suffered due to the excessive temperatures to the point where they have swelled and split. Batteries have been in service since 2007 and are also beyond end of life.
<b>Expenditure</b>	 Note that expenditure in 2019 has been phased into 2020 to allow for funding for higher priority ranked projects.
<b>NGR Criteria</b>	In accordance with NGR 79 (2)(c) the capital expenditure is necessary: <ul style="list-style-type: none"> <li>to maintain and improve the safety of services.</li> <li>to maintain the integrity of services.</li> </ul>

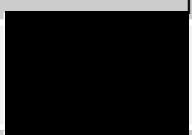
**Table 13: Upgrade of flow computers**

	Project Details
<b>Scope of work</b>	Upgrade Bristow flow computers, Conitel RTU's, associated equipment cabinets, DC circuit wiring and associated drawings and intrinsically safe barriers at 40 DBNGP metering sites.
<b>Justification / business need</b>	Justification for the project as follows: <ul style="list-style-type: none"> <li>40 flow computers are at the end of their operational life. Replacement spares are no longer available. Failure to implement this project will result in loss of billing data, site visibility and several safety concerns over inadequate 240VAC wiring.</li> <li>Existing electrical wiring drawings at most sites are inadequate to perform troubleshooting and engineering without site visit.</li> <li>Defunct equipment is installed at many sites and is still powered up (Modicon PLC, data-logger, inverters, heaters, CP PLC).</li> <li>All sites with RTU's are at end of life and required replacement.</li> <li>Hazardous area barriers must be upgraded as per current Hazardous Area Requirements.</li> </ul>
<b>Expenditure</b>	 It should be noted activity required to replace current flow computers will be completed in 2016 and 2017. The expenditure forecast in 2020 is for the next cycle of flow computer upgrades.
<b>NGR Criteria</b>	In accordance with NGR 79 (2)(c) the capital expenditure is necessary: <ul style="list-style-type: none"> <li>to maintain and improve the safety of services.</li> <li>to maintain the integrity of services.</li> </ul>

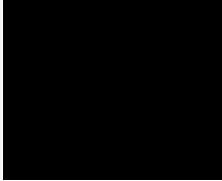
**Table 14: Provision for subsequent costs - Meter Stations**

	Project Details
<b>Scope of work</b>	<p>The Subsequent cost category, consistent with the requirements of AASB116 Property Plant and Equipment (PP&amp;E), captures expenditure incurred as a condition of continuing to operate an item of PP&amp;E. Regular day-to-day servicing expenditure is recognised through profit and loss (operating expenditure) as consumed and generally described as repairs and maintenance. However, major overhauls that effectively extend the life of an asset are classified as a subsequent cost of the assets continued use the costs of which are recognised as part the asset value.</p> <p>Maintenance expenses will be required for the following:</p> <ul style="list-style-type: none"> <li>• Gas turbine meter recertification</li> <li>• Mokveld valves and other miscellaneous valves overhauled</li> <li>• Pressure vessel re-inspections</li> </ul>
<b>Justification / business need</b>	<p>The proposed forecast expenditure is to allow DBP to carry out activities that are required to continue to operate assets. Activities include performing regular inspections for faults and the replacement of certain parts recognised as a cost item of property, plant and equipment. This annual provision is based on average annual historical spend.</p>
<b>Expenditure</b>	
<b>NGR Criteria</b>	<p>In accordance with NGR 79 (2)(c) the capital expenditure is necessary:</p> <ul style="list-style-type: none"> <li>• to maintain and improve the safety of services.</li> <li>• to maintain the integrity of services.</li> <li>• to comply with a regulatory obligation or requirement.</li> <li>• to maintain DBP's capacity to meet levels of demand for services existing at the time the capital expenditure is incurred.</li> </ul>

**Table 15: Upgrade of Coriolis meters**

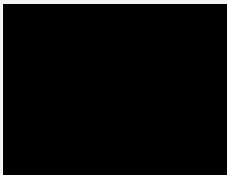
	Project Details
<b>Scope of work</b>	<p>Sixteen Coriolis meters have transmitters that are at end of life and are no longer supported. The existing transmitters are no longer available for purchase.</p>
<b>Justification / business need</b>	<p>This project is required for the following reasons:</p> <ul style="list-style-type: none"> <li>• Existing flow transmitters are failing.</li> <li>• Spares are unavailable for a replacement transmitter.</li> <li>• The flow elements were superseded 5 years ago.</li> </ul> <p>long term equipment replacement strategy.</p>
<b>Expenditure</b>	
<b>NGR Criteria</b>	<p>In accordance with NGR 79 (2)(c) the capital expenditure is necessary:</p> <ul style="list-style-type: none"> <li>• to maintain and improve the safety of services.</li> <li>• to maintain the integrity of services.</li> <li>• to maintain DBP's capacity to meet levels of demand for services existing at the time the capital expenditure is incurred.</li> </ul>

**Table 16: Provision for subsequent costs - EOP**

	Project Details
<p><b>Scope of work</b></p>	<p>The Subsequent cost category, consistent with the requirements of AASB116 Property Plant and Equipment (PP&amp;E), captures expenditure incurred as a condition of continuing to operate an item of PP&amp;E. Regular day-to-day servicing expenditure is recognised through profit and loss (operating expenditure) as consumed and generally described as repairs and maintenance. However, major overhauls that effectively extend the life of an asset are classified as a subsequent cost of the assets continued use the costs of which are recognised as part the asset value.</p> <p>Forecast for subsequent costs are expected:</p> <ul style="list-style-type: none"> <li>• Review of critical spares holding for Turbines</li> <li>• Solar Turbines control yearly software updates / review and implementation by Solar FSR</li> <li>• As-building of drawings as found during normal operation</li> <li>• Near maps licence</li> <li>• GIS Operational enhancements</li> <li>• Mainline Pressure Vessel Inspections</li> </ul>
<p><b>Justification / business need</b></p>	<p>The proposed forecast expenditure is to allow DBP to carryout activities that are required to continue to operate assets. Activities may include performing regular inspections for faults and the replacement of certain parts they can be recognised as a cost item of property, plant and equipment. This annual provision is based on average annual historical spend.</p> <p>Justification:</p> <ul style="list-style-type: none"> <li>• Lack of critical spares holding has caused turbines to be not available for operational use.</li> <li>• Constant changes and refinement of control software required to ensure reliable units.</li> <li>• As-building of existing infrastructure constantly required as identified during normal operation: P&amp;Id's, termination drawings, hazardous area drawings, general arrangement drawings for compressor stations.</li> <li>• Near Maps license required as these maps are used on the DBNGP GIS system</li> <li>• Constant patch and data enhancements required during normal operation. Database expanded and new information added.</li> <li>• AS3788 requires that pressure equipment, including pressure vessels, shall be inspected for integrity on a 4 yearly nominal frequency. Vessels at CS03, CS07 and CS09 are overdue for these inspections.</li> </ul>
<p><b>Expenditure</b></p>	
<p><b>NGR Criteria</b></p>	<p>In accordance with NGR 79 (2)(c) the capital expenditure is necessary:</p> <ul style="list-style-type: none"> <li>• to maintain and improve the safety of services.</li> <li>• to maintain the integrity of services.</li> <li>• to comply with a regulatory obligation or requirement.</li> <li>• to maintain DBP's capacity to meet levels of demand for services existing at the time the capital expenditure is incurred.</li> </ul>



**Table 17: Provision of subsequent costs (Compressor)**

	Project Details
<p><b>Scope of work</b></p>	<p>The Subsequent cost category, consistent with the requirements of AASB116 Property Plant and Equipment (PP&amp;E), captures expenditure incurred as a condition of continuing to operate an item of PP&amp;E. Regular day-to-day servicing expenditure is recognised through profit and loss (operating expenditure) as consumed and generally described as repairs and maintenance. However, major overhauls that effectively extend the life of an asset are classified as a subsequent cost of the assets continued use the costs of which are recognised as part the asset value.</p> <p>Some of the projects expected to be completed under the forecast for subsequent costs include :</p> <ul style="list-style-type: none"> <li>• 10 recycle valves</li> <li>• 2 dry gas seals</li> <li>• 3 pressure vessels</li> <li>• Scrubber and heater cleaning</li> <li>• White goods</li> <li>• CS7/2 hot end repair</li> <li>• 3 x CCVT canister replacements</li> <li>• Replacement of two actuators - station or units</li> <li>• Replacement of two boost compressor seals</li> <li>• Replacement of two valves - station or units</li> </ul>
<p><b>Justification / business need</b></p>	<p>The proposed forecast expenditure is to allow DBP to carryout activities that are required to continue to operate assets. Activities include performing regular inspections for faults and the replacement of certain parts. This annual provision is based on average annual historical spend.</p>
<p><b>Expenditure</b></p>	
<p><b>NGR Criteria</b></p>	<p>In accordance with NGR 79 (2)(c) the capital expenditure is necessary:</p> <ul style="list-style-type: none"> <li>• to maintain and improve the safety of services.</li> <li>• to maintain the integrity of services.</li> <li>• to comply with a regulatory obligation or requirement.</li> <li>• to maintain DBP's capacity to meet levels of demand for services existing at the time the capital expenditure is incurred.</li> </ul>

**Table 18: Provision of subsequent costs (Pipeline)**

	Project Details
<b>Scope of work</b>	The Subsequent cost category, consistent with the requirements of AASB116 Property Plant and Equipment (PP&E), captures expenditure incurred as a condition of continuing to operate an item of PP&E. Regular day-to-day servicing expenditure is recognised through profit and loss (operating expenditure) as consumed and generally described as repairs and maintenance. However, major overhauls that effectively extend the life of an asset are classified as a subsequent cost of the assets continued use the costs of which are recognised as part the asset value.
<b>Justification / business need</b>	The proposed forecast expenditure is to allow DBP to carryout activities that are required to continue to operate assets recognised as property, plant and equipment. Activities may include performing regular inspections for faults and the replacement of certain parts recognised as a cost item of property, plant and equipment. This annual provision is based on average annual historical spend.
<b>Expenditure</b>	
<b>NGR Criteria</b>	In accordance with NGR 79 (2)(c) the capital expenditure is necessary: <ul style="list-style-type: none"> <li>to maintain and improve the safety of services.</li> <li>to maintain the integrity of services.</li> <li>to comply with a regulatory obligation or requirement.</li> <li>to maintain DBP's capacity to meet levels of demand for services existing at the time the capital expenditure is incurred.</li> </ul>

**Table 19: Provision of projects initiated under MOC process**

	Project Details
<b>Scope of work</b>	Management of change projects are minor in nature with expenditure in the range of \$1000 to \$50,000.
<b>Justification / business need</b>	During the normal operation of the DBNGP, various design changes are required to: <ul style="list-style-type: none"> <li>Sustain business,</li> <li>Alleviate unsafe condition,</li> <li>Increase reliability,</li> <li>Make equipment more reliable</li> <li>Increase efficiency,</li> <li>Reduce costs</li> </ul> This annual provision is based on average annual historical spend.
<b>Expenditure</b>	
<b>NGR Criteria</b>	In accordance with NGR 79 (2)(c) the capital expenditure is necessary: <ul style="list-style-type: none"> <li>to maintain and improve the safety of services.</li> <li>to maintain the integrity of services.</li> <li>to comply with a regulatory obligation or requirement.</li> <li>to maintain DBP's capacity to meet levels of demand for services existing at the time the capital expenditure is incurred.</li> </ul>

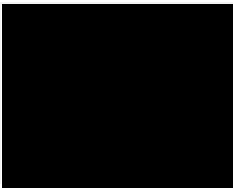
**Table 20: Annual allocation for vehicle fleet replacement programme**

	Project Details
<b>Scope of work</b>	Annual programme to replace DBNGP fleet vehicles which are both aging and have high kilometres. Replacement vehicles will be fitted in accordance with DBP specifications and requirements.
<b>Justification / business need</b>	DBP's policy is to replace vehicles that have exceeded 200,000km based on their condition/reliability deteriorating to the point that both safety and efficiency are compromised for travelling in remote areas. This is a key factor in ensuring that DBP's key risk - death or injury whilst driving - is managed to a risk of "as low as is reasonably practicable", as required by DBP's pipeline licences.  On average around 9 vehicles are replaced each year with replacement costs ranging from \$65k-90k depending on model and aftermarket fit out required.
<b>Expenditure</b>	
<b>NGR Criteria</b>	In accordance with NGR 79 (2)(c) the capital expenditure is necessary: <ul style="list-style-type: none"> <li>to maintain and improve the safety of services.</li> <li>to maintain the integrity of services.</li> <li>to comply with a regulatory obligation or requirement.</li> </ul>

**Table 21: Intelligent pigging**

	Project Details
<b>Scope of work</b>	<p><i>Lateral Pigging-</i> Pigging of the lateral that delivers gas to the CSBP plant is expected to be completed and it is expected to be completed during a CSBP shutdown. The lateral cannot be pigged during operation as its current configuration does not allow it. Pigging to consist of cleaning pig, gauge pig and intelligent line inspection pig. This could be completed by venting the line and pushing the pigs thru with water.</p> <p><i>Un-Piggable Laterals-</i> Many laterals have been constructed in the past with no allowances for internal inspection by intelligent Pigging. DBP has committed to develop a programme to initiate internal inspections of these pipelines.</p> <p><i>Main Line and Loop Line Pigging-</i> The DBNGP is made up of 1470 km of mainline and 1300 km of loopline, separated by 10 compressor stations. The last programme was started in FY 2010-11 and completed over a 2 year period. In that time the entire pipeline was inspected.  The mainline requires internal inspection every 10 years, whereas the loopline inspection regime has been set to 5 years.</p>
<b>Justification / business need</b>	Pigging is required under the Asset Management Plan and DBP's Safety Case.
<b>Expenditure</b>	
<b>NGR Criteria</b>	In accordance with NGR 79 (2)(c) the capital expenditure is necessary: <ul style="list-style-type: none"> <li>to maintain and improve the safety of services.</li> <li>to maintain the integrity of services.</li> <li>to comply with a regulatory obligation or requirement.</li> </ul>

**Table 22: Upgrade of station and unit Fire & Gas monitoring system**

	Project Details
<b>Scope of work</b>	<p>The scope includes the upgrade of fire and gas monitoring at CS2 and CS10.</p> <p>Each compressor station on the DBNGP is built with supporting facilities like control room, scrubber, after-cooler fans, GEAs, pig launcher &amp; receiver, control room building, workshop building, accommodation building, compressor building and fuel gas pressure reduction skid. All are equipped with suitable fire &amp; gas monitoring systems to handle the risk to plant and personnel. They are CO<sub>2</sub> based fire suppression systems for compressor unit buildings and water mist based fire suppression system for compressor enclosures.</p> <p>To handle the risk of fire and gas release, various types of sensors are used at compressor stations. All sensors are connected to programmable logic control (PLC) through the interfacing system.</p> <p>The scope of this project also includes the implementation of a standardised use of Station Emergency Shut Down (SESD) and Mainline Emergency Shut Down (MLESD).</p>
<b>Justification / business need</b>	<p>The existing system is expected to become obsolete. There is no vendor support and also impossible to repair in house. At present some of the sensors are isolated and in need of spares.</p>
<b>Expenditure</b>	
<b>NGR Criteria</b>	<p>In accordance with NGR 79 (2)(c) the capital expenditure is necessary:</p> <ul style="list-style-type: none"> <li>• to maintain and improve the safety of services.</li> <li>• to maintain the integrity of services.</li> <li>• to comply with a regulatory obligation or requirement.</li> </ul>

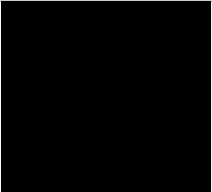
**Table 23: Retrofitting of fire suppression at compressor station**

	Project Details
<b>Scope of work</b>	<p>The scope includes the upgrade of fire and gas monitoring at CS4 and CS6.</p> <p>Each compressor station on the DBNGP is built with supporting facilities like control room, scrubber, after-cooler fans, GEAs, pig launcher &amp; receiver, control room building, workshop building, accommodation building, compressor building and fuel gas pressure reduction skid. All are equipped with suitable fire &amp; gas monitoring systems to handle the risk to plant and personnel. They are CO2 based fire suppression systems for compressor unit buildings and water mist based fire suppression system for compressor enclosures.</p> <p>To handle the risk of fire and gas release, various types of sensors are used at compressor stations. All sensors are connected to programmable logic control (PLC) through the interfacing system.</p> <p>The scope of this project also includes the implementation of a standardised use of Station Emergency Shut Down (SESD) and Mainline Emergency Shut Down (MLESD)</p>
<b>Justification / business need</b>	<p>The existing system is expected to become obsolete. There is no vendor support and also impossible to repair in house. At present some of the sensors are isolated and in need of replacement.</p>
<b>Expenditure</b>	
<b>NGR Criteria</b>	<p>In accordance with NGR 79 (2)(c) the capital expenditure is necessary:</p> <ul style="list-style-type: none"> <li>to maintain and improve the safety of services.</li> <li>to maintain the integrity of services.</li> <li>to comply with a regulatory obligation or requirement.</li> </ul>

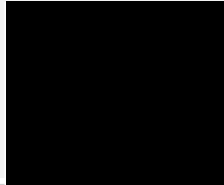
**Table 24: Implementation of DBNGP CP dig-up programme**

	Project Details
<b>Scope of work</b>	<p>This work is required to carry out the Cathodic protection dig-up programme which includes excavation and inspection of the DBNGP for coating and pipe damage assessing any signs of stress, corrosion or cracking.</p>
<b>Justification / business need</b>	<p>Dig-ups are required in order to determine the condition of the pipeline and coating by direct inspection as per AS 2885.</p> <p>Monitoring for SCC cannot be achieved in any other way except by exposing the pipe. The expenditure for this annual programme is based on historical average spend.</p>
<b>Expenditure</b>	
<b>NGR Criteria</b>	<p>In accordance with NGR 79 (2)(c) the capital expenditure is necessary:</p> <ul style="list-style-type: none"> <li>to maintain and improve the safety of services.</li> <li>to maintain the integrity of services.</li> <li>to comply with a regulatory obligation or requirement.</li> </ul>

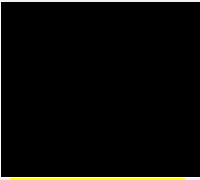
**Table 25: Refurbishment of below and above ground pipework**

	Project Details
<b>Scope of work</b>	Excavate and inspect the underground pipework at CS1 including the blasting of UHB epoxy coating and replacement with high-build Interzone 954 epoxy. This is an ongoing SIB project. The expenditure for 2016 will be work carried out at CS1. An annual allocation has been allowed for 2017-2020 for similar work to be carried out at other compressor stations.
<b>Justification / business need</b>	This is part of an ongoing plan to refurbish the coatings on underground compressor station pipework. The ultra-high-build epoxy is known to be failing i.e. it prevents the cathodic protection from being effective.
<b>Expenditure</b>	
<b>NGR Criteria</b>	In accordance with NGR 79 (2)(c) the capital expenditure is necessary: <ul style="list-style-type: none"> <li>• to maintain and improve the safety of services.</li> <li>• to maintain the integrity of services.</li> <li>• to comply with a regulatory obligation or requirement.</li> </ul>

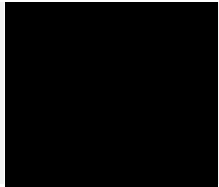
**Table 26: Painting of meter stations**

	Project Details
<b>Scope of work</b>	Painting of 3 to 4 sites per annum based on corrosion assessment. This is an annual allocation based on average historical expenditure.
<b>Justification / business need</b>	A site coating assessment was carried out in 2010 which found that there are a number of sites that are over 20 years old and are showing considerable coating and corrossions damage due to constant icing (pre-heater) and generally atmospheric exposure.
<b>Expenditure</b>	
<b>NGR Criteria</b>	In accordance with NGR 79 (2)(c) the capital expenditure is necessary: <ul style="list-style-type: none"> <li>• to maintain and improve the safety of services.</li> <li>• to maintain the integrity of services.</li> <li>• to comply with a regulatory obligation or requirement.</li> </ul>

**Table 27: Implementation of new financial management system**

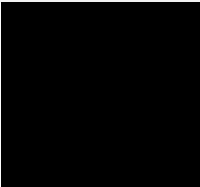
	Project Details
<b>Scope of work</b>	<p>Implement upgrades to an Enterprise Resource Planning (ERP) reporting system to replace the current systems (providing Financial Reporting, Payroll Processing and Project Management). DBP at the time of preparing this submission was managing the implementation of a new ERP system to transition away from the old SAP system which became an unviable option with DBP's decision to move to a new Corporate ICT provider in 2014.</p> <p>DBP has made an assumption that an upgrade will be required approximately every 5 years to maintain the financial reporting system. The upgraded ERP will add to the and maintain functionality in the following areas:</p> <ul style="list-style-type: none"> <li>• Advanced financial reporting.</li> <li>• Detailed budgeting forecasting tools.</li> <li>• Business intelligence reporting, including dashboard reporting with access to multiple DBP databases (incl historical SAP data, Maximo, CRS, SCADA and Visual Risk).</li> <li>• Improved project management reporting, including integration to MS Project.</li> <li>• Payroll &amp; HR Kiosking – including user friendly payroll system, employee self-service functionality.</li> <li>• Better integration into existing DBP systems (Maximo, CRS)</li> </ul>
<b>Justification / business need</b>	<p>DBP is required to have a fit for purpose ERP to allow it to meet a number of financial reporting, regulatory and accounting requirements.</p> <p>DBP expected, in implementing the ERP solution replacing SAP, would be superior in functionality and reduce costs over the AA Period.</p>
<b>Expenditure</b>	
<b>NGR Criteria</b>	<p>In accordance with NGR 79 (2)(c) the capital expenditure is necessary:</p> <ul style="list-style-type: none"> <li>• to maintain the integrity of services.</li> <li>• to comply with a regulatory obligation or requirement.</li> </ul>

**Table 28: Replacement of earthing systems at Compressor Stations**

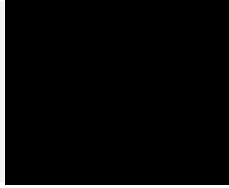
	Project Details
<b>Scope of work</b>	<p>Excavation of below ground pipe work to enable the repair of coating and alternation of copper earthing grid to zinc diamond line. This is an annual allocation based on average historical expenditure. Lower expenditure in 2016 is a product of converting the forecast from financial year to calendar year.</p>
<b>Justification / business need</b>	<p>It was assessed that compressor stations required coating repair and works to bring cathodic protection up to a similar standard to other sites on the DBNGP. Due to works being carried out on compressor station below ground pipework, these facilities will be better protected from corrosion and the earthing grip will be compatible with the present cathodic protection system reducing the risk of accelerated bi-metal corrosion.</p> <p>This work is required to ensure compliance with the Asset Management Plan and the Safety Case</p>
<b>Expenditure</b>	

	Project Details
<b>NGR Criteria</b>	In accordance with NGR 79 (2)(c) the capital expenditure is necessary: <ul style="list-style-type: none"> <li>to maintain and improve the safety of services.</li> <li>to maintain the integrity of services.</li> <li>to comply with a regulatory obligation or requirement.</li> </ul>

**Table 29: Replacements of earthing systems at meter stations**

	Project Details
<b>Scope of work</b>	As per Table 28
<b>Justification / business need</b>	As above
<b>Expenditure</b>	
<b>NGR Criteria</b>	In accordance with NGR 79 (2)(c) the capital expenditure is necessary: <ul style="list-style-type: none"> <li>to maintain and improve the safety of services.</li> <li>to maintain the integrity of services.</li> </ul>

**Table 30: Rectification of hazardous area equipment installations**

	Project Details
<b>Scope of work</b>	<p>As a requirement under AS 2381 and AS 60079, DBP is required to conduct visual inspection of all equipment installed in the hazardous area every 4 years. The inspection is carried out by third party contractor.</p> <p>The contractor prepares a report of any non-conformity found on the equipment. Under the scope of this project, all the non-conformities will be rectified to meet the requirement of hazardous area installation standards.</p> <p>The scope covers rectification of hazardous area equipment installed at compressor stations CS03, CS04, CS07, CS08 and CS10 in 2016.</p> <p>Annual allocations for year 2017 to 2020 have been included for similar work to be carried out on other sites.</p>
<b>Justification / business need</b>	Required under AS 2381 and AS 60079.
<b>Expenditure</b>	
<b>NGR Criteria</b>	In accordance with NGR 79 (2)(c) the capital expenditure is necessary: <ul style="list-style-type: none"> <li>to maintain and improve the safety of services.</li> <li>to comply with a regulatory obligation or requirement.</li> </ul>



**Table 31: Inspection of hazardous areas**

	Project Details
<b>Scope of work</b>	<p>As a requirement under AS 2381 and AS 60079, DBP will conduct visual inspection of all equipment installed in hazardous areas within the DBNGP every 4 years. The inspection is carried out by a third party contractor.</p> <p>The scope of the project includes inspections at meter stations north of CS10 and MLV sites.</p> <p>This expenditure is based on average historical expenditure.</p>
<b>Justification / business need</b>	Required under AS 2381 and AS 60079.
<b>Expenditure</b>	
<b>NGR Criteria</b>	<p>In accordance with NGR 79 (2)(c) the capital expenditure is necessary:</p> <ul style="list-style-type: none"> <li>to maintain and improve the safety of services.</li> <li>to comply with a regulatory obligation or requirement.</li> </ul>

**Table 32: Software modification for NP Turbine compressor units at CS6/2 and CS9/1**

	Project Details
<b>Scope of work</b>	<p>The project involves consolidation of all software related work, engineering and off site testing of proposed changes, onsite installation &amp; testing of modified software for Nuovo Pignone turbines.</p> <p>An allocation is allowed for commencing a total upgrade of the Nuovo Pignone HMI software in 2020.</p>
<b>Justification / business need</b>	<p>Due to change in the operating condition, compressor software requires modification to overcome the operation constraints, optimise the operation, improve the reliability and ensure the integrity of assets.</p> <p>All the changes are assessed and approved by EC&amp;I through Operational System Change Control (OSCC) procedure. Sometimes the vendor's input is required to implement those changes due to their safety critical nature.</p> <p>Also, the vendor publishes service bulletins to address any asset integrity issue across their global fleet. Under the proposed work, software modification will be consolidated and implemented once a year with the help of the Original Equipment Manufacturer.</p>
<b>Expenditure</b>	
<b>NGR Criteria</b>	<p>In accordance with NGR 79 (2)(c) the capital expenditure is necessary:</p> <ul style="list-style-type: none"> <li>to maintain and improve the safety of services.</li> <li>to maintain the integrity of services.</li> <li>to maintain DBP's capacity to meet levels of demand for services existing at the time the capital expenditure is incurred.</li> </ul>

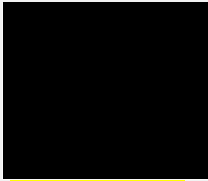
**Table 33: Software modification for Solar Turbine compressor units**

	Project Details
<b>Scope of work</b>	The project involves consolidation of all Control Programmable Logic Control (PLC) Software related work, Engineering and Off Site testing of proposed PLC changes and the onsite installation & testing of modified PLC Control software for Solar Gas Turbines. An allocation is allowed for commencing a total upgrade of the Nuovo Pignone HMI software in 2020.
<b>Justification / business need</b>	<p>Due to change in the operating condition Compressor software requires modification to overcome the operation constraints, optimise the operation, improve the reliability and ensure the integrity of assets.</p> <p>All the changes are assessed and approved by EC&amp;I section through an Operational System Change Control (OSCC) procedure.</p> <p>Sometimes the vendor's input is required to implement those changes due to their safety critical nature.</p> <p>The vendor publishes service bulletins to address any asset integrity issue across their global fleet. Under the proposed work, these software modifications will be consolidated and implemented once in a year with the help of the Original Equipment Manufacturer.</p>
<b>Expenditure</b>	
<b>NGR Criteria</b>	<p>In accordance with NGR 79 (2)(c) the capital expenditure is necessary:</p> <ul style="list-style-type: none"> <li>• to maintain and improve the safety of services.</li> <li>• to maintain the integrity of services.</li> <li>• to maintain DBP's capacity to meet levels of demand for services existing at the time the capital expenditure is incurred.</li> </ul>

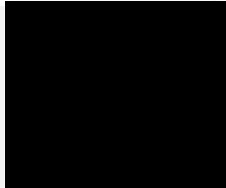
**Table 34: Solar & GE Windows XP based HMI upgrade**

	Project Details
<b>Scope of work</b>	Upgrading Solar and GE HMI operating software systems to Windows 7 by replacing the existing Windows XP operating system and the existing hardware platforms. An allocation is allowed for commencing the next cycle of upgrade in 2019 and 2020.
<b>Justification / business need</b>	<p>The project is based on the following justification:</p> <ul style="list-style-type: none"> <li>• The current Solar HMI Gas Turbine HMI systems operate on Windows XP which will no longer be supported by Microsoft after the first quarter 2014. This lack of support could place systems at risk.</li> <li>• With the latest Windows platform, the Solar HMI also meets the new ANSI/ISA-18.2-2009 "Management of Alarm Systems for the Process Industry" mandatory standards.</li> </ul>
<b>Expenditure</b>	
<b>NGR Criteria</b>	<p>In accordance with NGR 79 (2)(c) the capital expenditure is necessary:</p> <ul style="list-style-type: none"> <li>• to maintain the integrity of services.</li> <li>• to comply with a regulatory obligation or requirement.</li> <li>• to maintain DBP's capacity to meet levels of demand for services existing at the time the capital expenditure is incurred.</li> </ul>

**Table 35: Upgrade of station PLC at compressor stations**

	Project Details
<b>Scope of work</b>	Replace the Station Programmable Logic Control (PLC) at CS03, CS05 and CS08 with the latest proven PLC family. The entire project will be completed with similar annual expenditure over multiple years.
<b>Justification / business need</b>	<ul style="list-style-type: none"> <li>• Obsolete PLC system</li> <li>• In absence of station PLC, TSCC (DBP gas control) will not be able to initiate Station Emergency Shut-Down (SESD), Mainline ESD in the event of emergency.</li> </ul>
<b>Expenditure</b>	
<b>NGR Criteria</b>	In accordance with NGR 79 (2)(c) the capital expenditure is necessary: <ul style="list-style-type: none"> <li>• to maintain and improve the safety of services.</li> <li>• to maintain the integrity of services.</li> </ul>

**Table 36: Upgrade of fire and gas equipment at MLV and meter stations**

	Project Details
<b>Scope of work</b>	<p>The existing MLV and meter stations were originally commissioned with either a CMOS or ODG fire and gas system integrated with a Halon deluge system. Halon systems were later removed. Since the removal of the Halon system the units have experienced continuous spurious faults and fire alarms. DBP has documented 270 corrective maintenance work orders since 2008. Continuous repair is expensive and many parts are no longer available.</p> <p>The proposed project will review and define the new F&amp;G philosophy for each type of site based on power set up. This solution was chosen for the following reasons:</p> <ol style="list-style-type: none"> <li>1) Increased likelihood that solution will be integrated into existing systems; and</li> <li>2) Improved gas detection using standard equipment.</li> </ol> <p>New F&amp;G philosophy for Pulse Access Valve (PAV) sites developed and implementation is in progress on those sites. In the coming years it is proposed to change F&amp;G system at all MLV and meter sites as per standard philosophy</p>
<b>Justification / business need</b>	<p>The project is based on the following justification:</p> <ul style="list-style-type: none"> <li>• The existing system is at end of life (over 25 years old) and replacement parts are no longer available.</li> <li>• The cost to send an item away for repair is very expensive and still does not guarantee reliability.</li> <li>• Valuable man hours are being wasted on reactive work due to faulty equipment,</li> <li>• Unnecessary travel is created due to staff having to react and respond to faults continuously occurring in these systems</li> <li>• The safety of staff and equipment is compromised with unreliable equipment.</li> <li>• A new fire and gas systems will greatly reduce the cost of maintenance.</li> </ul>
<b>Expenditure</b>	
<b>NGR Criteria</b>	In accordance with NGR 79 (2)(c) the capital expenditure is necessary: <ul style="list-style-type: none"> <li>• to maintain and improve the safety of services.</li> <li>• to maintain the integrity of services.</li> <li>• to comply with a regulatory obligation or requirement.</li> </ul>

**Table 37: Annual provision for IT items**

	Project Details
<b>Scope of work</b>	<p>Scope of work as follows:</p> <ul style="list-style-type: none"> <li>• Continue PC replacement programme to ensure all PCs are fit for purpose and under warranty;</li> <li>• Printer replacement; and</li> <li>• DBP software licensing agreement costs.</li> </ul>
<b>Justification / business need</b>	<p>The project is based on the following justification:</p> <ul style="list-style-type: none"> <li>• ensure all PCs are fit for purpose and under warranty.</li> <li>• Printers &gt;5yo are considered end of economic life. Replace monochrome laser printers more than five years old.</li> <li>• DBP has signed a licensing agreement covering standard desktop software and Server Operating System software. There is a contractual obligation to pay the true-up charge.</li> </ul>
<b>Expenditure</b>	
<b>NGR Criteria</b>	<p>In accordance with NGR 79 (2)(c) the capital expenditure is necessary:</p> <ul style="list-style-type: none"> <li>• to maintain the integrity of services.</li> <li>• to maintain DBP's capacity to meet levels of demand for services existing at the time the capital expenditure is incurred.</li> </ul>

**Table 38: Customer Reporting System (CRS)**

	Project Details
<b>Scope of work</b>	<p>Implement system modifications resulting from review of commercial processes and shipper engagement.</p>
<b>Justification / business need</b>	<p>CRS is a highly customised software package that interfaces with the DBNGP SCADA system and allows DBP to perform its billing and other reporting obligations. It is also an online portal for Shippers to make daily gas nominations and obtain system information. It is important this is maintained and evolved to meet requirements of DBP and its stakeholders.</p> <p>This expenditure is based on historical average annual spend on CRS modifications</p>
<b>Expenditure</b>	
<b>NGR Criteria</b>	<p>In accordance with NGR 79 (2)(c) the capital expenditure is necessary:</p> <ul style="list-style-type: none"> <li>• to maintain the integrity of services.</li> </ul>

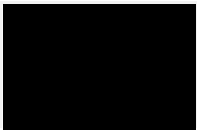
**Table 39: Production of safety key site drawings**

	Project Details
<b>Scope of work</b>	<p>Improve the following safety critical DBNGP key site drawings:</p> <ul style="list-style-type: none"> <li>• Piping layout</li> <li>• Piping and instrument diagrams</li> <li>• Electrical schematics for power distribution, emergency shutdown, gas service valve control and equipment located in hazardous areas</li> </ul>
<b>Justification / business need</b>	<p>The project is based on the following justification:</p> <ul style="list-style-type: none"> <li>• Safety and Operational Critical Drawings - these are key drawings upon which work planning, safe working isolations and corrective action works are based. If the drawings are not clear or are misleading, it can contribute to error and delay.</li> <li>• Project modifications are shown on separate drawings showing only fragments on each. This has been a practice dating back to the mid-1980s.</li> <li>• The Asset Management Plan and the Safety Case require up to date plans to be available</li> </ul>
<b>Expenditure</b>	
<b>NGR Criteria</b>	<p>In accordance with NGR 79 (2)(c) the capital expenditure is necessary:</p> <ul style="list-style-type: none"> <li>• to maintain and improve the safety of services.</li> <li>• to maintain the integrity of services.</li> <li>• to comply with a regulatory obligation or requirement.</li> </ul>

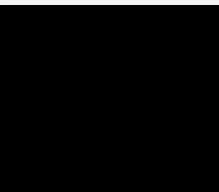
**Table 40: Replacement of reverse osmosis units**

	Project Details
<b>Scope of work</b>	<p>Reverse Osmosis (RO) units provide each site with water. The water is used for drinking and all potable requirements.</p> <p>Reverse Osmosis (RO) units are to be replaced / upgraded / installed at all relevant sites over the course of this programme.</p>
<b>Justification / business need</b>	<p>The main drivers for an upgrade program at this time are:</p> <ul style="list-style-type: none"> <li>• Most of the compressor station sites on the DBNGP do not have access to reticulated fresh water. RO units have therefore been installed at these sites to make bore water potable.</li> <li>• RO units are around 20 years and many are obsolete, with rising maintenance requirements.</li> <li>• Changes in the water table have changed the quality of the ground water affecting the production of adequately refined water for the sites.</li> <li>• Furthermore, there is a risk that the means by which the waste from the systems is discharged is not compliant with the Environmental Plan for the pipeline (approved as part of the pipeline licence).</li> <li>• The new units provide IntelliSys control, allowing remote access by Maintenance and SDO teams through the SCADA system.</li> <li>• Implement waste management of the RO units by improving current design and operation ponds in order to comply with industry best practice.</li> </ul>
<b>Expenditure</b>	
<b>NGR Criteria</b>	<p>In accordance with NGR 79 (2)(c) the capital expenditure is necessary:</p> <ul style="list-style-type: none"> <li>• to maintain and improve the safety of services.</li> <li>• to maintain the integrity of services.</li> <li>• to comply with a regulatory obligation or requirement.</li> </ul>

**Table 41: Replacement of wall and roof sheeting for comms, GEA huts and repeater sites**

	Project Details
<b>Scope of work</b>	Replacement wall and roof sheeting by building contractor for repeater huts due to corrosion of original sheets. Install ladder safety attachment point to GEA hut roof for maintenance on solar panels, exhaust outlets, vents and fan cowlings.
<b>Justification / business need</b>	Several of the southern sites show severe corrosion on the wall and roof sheets, and in some cases this has allowed water ingress into the hut and onto GEA alternators.
<b>Expenditure</b>	
<b>NGR Criteria</b>	In accordance with NGR 79 (2)(c) the capital expenditure is necessary: <ul style="list-style-type: none"> <li>to maintain and improve the safety of services.</li> <li>to maintain the integrity of services.</li> </ul>

**Table 42: Inspection of Nuovo Pignone unit hot gas path at CS6**

	Project Details
<b>Scope of work</b>	Replacement and inspection of all hot gas path components on CS6 unit 2 GE Nuovo Pignone gas turbine. Initial work at CS6 will be completed in 2016 and 2017. The forecast expenditure in 2019 and 2020 allows for the same work to be carried out when the gas turbine reaches its operating hours limit again.
<b>Justification / business need</b>	Nuovo Pignone gas turbines require intermediate maintenance to be performed at 17,000 operating hours to ensure that the hot gas path components do not degrade past their useful life and that they can then be repaired. The engine has reached its operating hours limit of 17,000 hours for this Hot Gas Path Inspection and requires replacement of all worn or thermally affected hot section components with new or refurbished components. The expenditure is for external consultants and installation contractors to perform the wheel replacement.
<b>Expenditure</b>	
<b>NGR Criteria</b>	In accordance with NGR 79 (2)(c) the capital expenditure is necessary: <ul style="list-style-type: none"> <li>to maintain and improve the safety of services.</li> <li>to maintain the integrity of services.</li> <li>to maintain DBP's capacity to meet levels of demand for services existing at the time the capital expenditure is incurred.</li> </ul>

**Table 43: Replacement of D2 with D4 wheels**

	Project Details
<b>Scope of work</b>	Compressor wheel replacement at CS2/3 and CS6/3.
<b>Justification / business need</b>	<p>During bundle inspection in November 2010 to investigate rubbing of the compressor rotor, cracks were identified in D2 impellers. Solar's initial advice was that impeller cracks were a known problem and were non-destructive i.e. the damage limits itself to the impeller vane leading edges and would not impact operation and often goes undetected until overhaul.</p> <p>However, the failure of a D2 wheel in a domestic US installation saw Solar structurally redesign and replace the D2 with a "D4" wheel to completely eliminate the risk of cracks or loss of material.</p> <p>Solar has agreed to provide three additional D4 wheels (free of cost) that would cover any eventualities as future inspections are conducted.</p> <p>The expenditure is for external consultants and installation contractors to perform the wheel replacement.</p>
<b>Expenditure</b>	
<b>NGR Criteria</b>	<p>In accordance with NGR 79 (2)(c) the capital expenditure is necessary:</p> <ul style="list-style-type: none"> <li>to maintain and improve the safety of services.</li> <li>to maintain the integrity of services.</li> <li>to maintain DBP's capacity to meet levels of demand for services existing at the time the capital expenditure is incurred.</li> </ul>

**Table 44: Replacement of air conditioning at compressor stations**

	Project Details
<b>Scope of work</b>	This project is an annual replacement programme for air conditioner units at CS1 to CS8, targeting units that are faulty and have reached the end of life.
<b>Justification / business need</b>	<p>On the DBNGP, air conditioners are critical equipment for controlling room temperatures for the following reasons:</p> <ul style="list-style-type: none"> <li>Certain equipment become less reliable at high temperature</li> <li>Control living conditions at accommodation buildings</li> <li>Management of fatigue for the DBP personnel</li> </ul> <p>The expenditure is based on annual average historical expenditure.</p>
<b>Expenditure</b>	
<b>NGR Criteria</b>	<p>In accordance with NGR 79 (2)(c) the capital expenditure is necessary:</p> <ul style="list-style-type: none"> <li>to maintain and improve the safety of services.</li> <li>to maintain the integrity of services.</li> </ul>

**Table 45: 24VDC batteries and chargers replacements**

	Project Details
<b>Scope of work</b>	Replacement of 24VDC batteries and charges over a three year period. Batteries are required as a back-up power source for control systems in compressor stations. A total of 96 batteries and 1 battery charger set will be replaced at each compressor station.
<b>Justification / business need</b>	The project is based on the following justification: <ul style="list-style-type: none"> <li>• Obsolete equipment with no support</li> <li>• Spare parts are no longer available</li> <li>• Faults on these systems are increasing</li> <li>• Currently there three battery chargers isolated due to failures</li> <li>• Batteries are at the limits of their designed lifespan</li> </ul>
<b>Expenditure</b>	
<b>NGR Criteria</b>	In accordance with NGR 79 (2)(c) the capital expenditure is necessary: <ul style="list-style-type: none"> <li>• to maintain and improve the safety of services.</li> <li>• to maintain the integrity of services.</li> <li>• to maintain DBP's capacity to meet levels of demand for services existing at the time the capital expenditure is incurred.</li> </ul>

**Table 46: Replacement of 110V DC Batteries and battery charger review**

	Project Details
<b>Scope of work</b>	Replace the 110VDC Battery Chargers and Battery Banks for all compressor stations. CS6 and CS9 have been completed. This project applies to CS1, 2, 3, 4, 5, 7 and 8 is scheduled to be completed over a four year period.
<b>Justification / business need</b>	Justifications: <ul style="list-style-type: none"> <li>• Obsolete equipment with no support</li> <li>• Spare parts are no longer available</li> <li>• Faults on these systems are increasing</li> <li>• Currently there two battery chargers isolated due to failures</li> </ul>
<b>Expenditure</b>	
<b>NGR Criteria</b>	In accordance with NGR 79 (2)(c) the capital expenditure is necessary: <ul style="list-style-type: none"> <li>• to maintain and improve the safety of services.</li> <li>• to maintain the integrity of services.</li> <li>• to maintain DBP's capacity to meet levels of demand for services existing at the time the capital expenditure is incurred.</li> </ul>

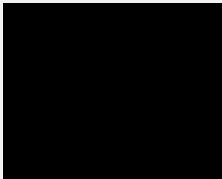


**Table 47: Upgrade of GEA & DEA controls at CS1 to 8**

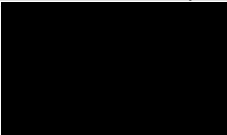
	Project Details
<b>Scope of work</b>	<p>The project scope includes:</p> <ul style="list-style-type: none"> <li>• Upgrade the existing GEA (Gas Engine Alternators) and DEA (Diesel Engine Alternators) Control Systems at Compressor Stations 1 to 8.</li> <li>• Improve integration and enhance the maintenance and operability of the GEA's.</li> <li>• Improve ability to monitor GEA / DEA operating parameters and KPI Functions.</li> <li>• Provide automatic selection of a generation unit for optimum efficiency.</li> <li>• Reduce the GEA fuel consumption to lower fuel costs</li> <li>• Reduce the GEA CO<sub>2</sub> emissions</li> </ul> <p>This project will be carried out over multiple years due to the number of sites and extensive work involved.</p>
<b>Justification / business need</b>	Enhance generator and power distribution reliability and efficiency, and to improve the stability of the Compressor Station Power System
<b>Expenditure</b>	
<b>NGR Criteria</b>	<p>In accordance with NGR 79 (2)(c) the capital expenditure is necessary:</p> <ul style="list-style-type: none"> <li>• to maintain the integrity of services.</li> <li>• to maintain DBP's capacity to meet levels of demand for services existing at the time the capital expenditure is incurred.</li> </ul>

**Table 48: CS1-CS9 power system rationalisation**

	Project Details
<b>Scope of work</b>	<p>This project is the follow-up to the Front End Engineering Design (FEED) study of the Compressor Station Power Systems. This Project will enhance the Controllability / Operability and improve the stability of the DBNGP Compressor Station Power Generation Systems (GEA and DEA). The following summarises the approach to the GEA-DEA Controllability Project:</p> <ul style="list-style-type: none"> <li>• Rationalise operating data being collected with regard to Alarm, Shutdown and Monitoring Efficiency Points.</li> <li>• Enhance Controllability of the Control Systems to improve the stability of the Compressor Station Power Systems.</li> <li>• Simple and reliable Low Load programmable solutions to address the issue of running the GEA / DEAs on low station loads.</li> <li>• Direct ACF (After Cooler Fan) Base Temperature Control, as opposed to Station Discharge Temperature control of the ACF, to address the issue of running ACFs when they not required.</li> <li>• The added benefit of this is that reducing the number of ACFs running may reduce the station loading to a point where it is more efficient to switch to a smaller GEA.</li> <li>• Lower maintenance costs when the Load Banks and After Cooler Fans are run significantly less.</li> <li>• The Load Management regime for each site will be reviewed and recommendations made to improve the stability of the power systems.</li> <li>• E.g. CS06 automatic load bank top-up when Station load requires both the 400kW Deutz GEAs to be online.</li> <li>• Power Generation management for each site will be reviewed and recommendations made to improve the reliability and efficiency of the power systems.</li> <li>• E.g. The LM (Load Management) PLC or PSC (Power System Controller) may</li> </ul>

	Project Details
	<p>determine the optimal sized GEA to power the site, and will externally force this GEA to a Priority 0, therefore nominating it as the highest priority GEA within the Intellisys Power Management system.</p> <ul style="list-style-type: none"> <li>As well as maintenance benefits, there are significant carbon footprint benefits from optimising the size of the GEA required for efficient Compressor Station operation.</li> <li>One or two compressor stations to be upgraded annually</li> </ul>
<b>Justification / business need</b>	<p>The project is based on the following justification:</p> <ul style="list-style-type: none"> <li>Pre-Stage 5 Power Generation control systems have reached the limit of their useable life.</li> <li>The older Control Systems and Hardware have become obsolete and therefore is in need of migration to the current / future generation control system hardware and software.</li> <li>Legacy GEA control system architecture severely restricts the effective integration into the existing Compressor Station Control System, leading to a complex PLC hardware communication system and in some cases a loss of event history.</li> <li>Of particular importance, is the identification of redundant and obsolete legacy code, associated panel wiring and the control devices that should be replaced or removed during this standardisation process. Drawings need to be marked up during this process.</li> <li>In light of the above, a FEED study was undertaken to determine the control requirements to bring the GEA Control Systems in line with the DBP Control System Hierarchy &amp; Philosophy which will improve the reliability of power generation equipment at Compressor Stations on the DBNGP.</li> </ul>
<b>Expenditure</b>	
<b>NGR Criteria</b>	<p>In accordance with NGR 79 (2)(c) the capital expenditure is necessary:</p> <ul style="list-style-type: none"> <li>to maintain the integrity of services.</li> <li>to maintain DBP's capacity to meet levels of demand for services existing at the time the capital expenditure is incurred.</li> </ul>

**Table 49: Replacement of unit control systems at CS2/2, CS4/2 and CS7/2**

	Project Details
<p><b>Scope of work</b></p>	<p>Replace existing Allen Bradley PLC 5/80 based control system with an Allen Bradley ControlLogix PLC based control system at CS02/U2, CS04/U2 and CS07/U2.</p> <p>The existing control panels will be removed by disconnecting existing filed cables. New panels will be installed on the existing panel foot print. The control cables will be reconnected to the new control panel and Control System I/O.</p> <p>Also under this project following will be replaced:</p> <ul style="list-style-type: none"> <li>• The VFD (Variable Frequency Drive) units for controlling the Turbine Starter Motor will be replaced with the latest generation VFD Drive.</li> <li>• Solar will optimise the Gas Turbine performance by replacing the existing outdated Hydraulic Actuated Fuel, Bleed Valve and IGV Control Valves with PECC Electronic Actuator and Valve assemblies.</li> <li>• Seal Gas and Buffer air transmitter as required by Solar Turbines.</li> <li>• Anti-surge valve positioner.</li> </ul> <p>This is a separate project from the project in Table 35 due to the different PLC system being used for different gas turbines.</p>
<p><b>Justification / business need</b></p>	<p>The project is based on the following justification:</p> <ul style="list-style-type: none"> <li>• The existing control system is Allen Bradley PLC 5/80 based system. This system was installed and commissioned during Stage 3 Expansion Phase (1998).</li> <li>• The present Control System PLC and Software is considered by Solar Turbines to be obsolete and would not be supported by the vendor. There is a very limited vendor support and will reduce to non-existent with time.</li> <li>• This capital expenditure will ensure that obsolete hardware will be changed in a timely manner without affecting the reliable and safe operation of unit.</li> <li>• Solar Turbines has introduced a control optimisation algorithm in their new ControlLogix based control system which is not compatible with the existing PLC5 based control system.</li> <li>• The Control Panel replacement will remove this obsolete system and Solar Turbines will provide a reliable backup fault-finding and replacement service.</li> </ul>
<p><b>Expenditure</b></p>	
<p><b>NGR Criteria</b></p>	<p>In accordance with NGR 79 (2)(c) the capital expenditure is necessary:</p> <ul style="list-style-type: none"> <li>• to maintain and improve the safety of services.</li> <li>• to maintain the integrity of services.</li> <li>• to maintain DBP's capacity to meet levels of demand for services existing at the time the capital expenditure is incurred.</li> </ul>

**Table 50: Replacement of concrete supports**

	Project Details
<b>Scope of work</b>	Above-ground concrete plinths that support pipe in 180 degree cylindrical gutters will be cut away and replaced with square steel supports. The supporting contact areas will be inspected for the first time since installation and the coating repaired if necessary.
<b>Justification / business need</b>	The guttered concrete plinth supports prevent any kind of inspection of the pipe contact surface. They prevent re-coating of the contact area and constitute a crevice that can trap water and debris. Other water and debris traps at surface sites have exhibited accelerated coating deterioration and corrosion, e.g. horizontal flanges.
<b>Expenditure</b>	
<b>NGR Criteria</b>	In accordance with NGR 79 (2)(c) the capital expenditure is necessary: <ul style="list-style-type: none"> <li>to maintain and improve the safety of services.</li> <li>to maintain the integrity of services.</li> </ul>

**Table 51: Jandakot workshop tools**

	Project Details
<b>Scope of work</b>	Tool and equipment procurement for the set-up of the overhaul/repairs workshop at the Jandakot depot facility. An annual provision is based on average historical annual expenditure.
<b>Justification / business need</b>	To have the ability to perform in-house repairs using equipment that is fit for purpose.
<b>Expenditure</b>	
<b>NGR Criteria</b>	In accordance with NGR 79 (2)(c) the capital expenditure is necessary: <ul style="list-style-type: none"> <li>to maintain and improve the safety of services.</li> <li>to maintain the integrity of services.</li> </ul>

**Table 52: SDO tools**

	Project Details
<b>Scope of work</b>	Procure tools for engineering staff forming part of the System Design and Operations division to perform required duties.
<b>Justification / business need</b>	Tools are integral part of the expected duties of the engineers and specialists. This expenditure is based on historical annual average expenditure.
<b>Expenditure</b>	
<b>NGR Criteria</b>	In accordance with NGR 79 (2)(c) the capital expenditure is necessary: <ul style="list-style-type: none"> <li>to maintain and improve the safety of services.</li> <li>to maintain the integrity of services.</li> </ul>

**Table 53: 6x4 tipper, tag trailer and skid steer loader**

	Project Details
<b>Scope of work</b>	Purchase of civil equipment including 6x4 tipper, tag trailer and skid steer loader.
<b>Justification / business need</b>	The new equipment selected is versatile and ideal for the maintenance work that is required to complete work on the DBNGP.
<b>Expenditure</b>	
<b>NGR Criteria</b>	In accordance with NGR 79 (2)(c) the capital expenditure is necessary: <ul style="list-style-type: none"> <li>to maintain the integrity of services.</li> <li>to comply with a regulatory obligation or requirement.</li> </ul>

**Table 54: Installation of soft start modifications to aftercooler MCC**

	Project Details
<b>Scope of work</b>	<p>Refurbishment and modification of all the Aftercooler Fan Motor Control Centre (MCC) draws (currently Direct Online (DOL) or Autotransformer Type) at Eight Compressor Stations.</p> <p>This project will initiate soft start and belt monitoring capable MCC Draw, for lower inrush current, reducing the severe wear and tear on the belts and motors with the existing DOL / Autotransformer Systems.</p> <p>This will also reduce the excessive overloading loading of the GEA Power System when Aftercooler Fans are started.</p>
<b>Justification / business need</b>	<p>The project is based on the following justification:</p> <ul style="list-style-type: none"> <li>The existing After Cooler MCC Draws are failing (Parts are not available) after years of service with the DOL and Autotransformer systems installed.</li> <li>Failures of After Cooler MCC Draws will render Compressor Units unavailable or restrict the throughput through the Station during periods of high flow, especially in summer months, thus affecting the delivery of the contracted gas capacity.</li> <li>The required modification to the MCC Draws will assist in the Station GEA reliability by gradually loading up the GEAs while After Cooler fans coming online, rather than throwing block loads (transients) on GEAs which has a tendency to trip the running GEA.</li> <li>Spare parts for existing After Cooler drawers are not available</li> </ul>
<b>Expenditure</b>	
<b>NGR Criteria</b>	In accordance with NGR 79 (2)(c) the capital expenditure is necessary: <ul style="list-style-type: none"> <li>to maintain and improve the safety of services.</li> <li>to maintain the integrity of services.</li> <li>to maintain DBP's capacity to meet levels of demand for services existing at the time the capital expenditure is incurred.</li> </ul>

**Table 55: Field technical services tools**

	Project Details
<b>Scope of work</b>	The purchase of specialist tools for Rotating Plant Mechanical, Gas Measurement, and Rotating Plant Control Systems teams within the Maintenance division.
<b>Justification / business need</b>	Procurement of specialised equipment and tooling to facilitate the Field Technical Services Group’s function to support and investigate various tasks that involve diagnostics and project work directly related to DBNGP asset and personnel. Expenditure is based on historical annual average expenditure.
<b>Expenditure</b>	
<b>NGR Criteria</b>	In accordance with NGR 79 (2)(c) the capital expenditure is necessary: <ul style="list-style-type: none"> <li>to maintain and improve the safety of services.</li> <li>to maintain the integrity of services.</li> </ul>

**Table 56: Maintenance tools**

	Project Details
<b>Scope of work</b>	Purchase selected tooling to ensure maintenance activities are carried out efficiently and safely.
<b>Justification / business need</b>	Tools are integral part of the expected duties of the engineers and specialists. Expenditure is based on historical annual average expenditure.
<b>Expenditure</b>	
<b>NGR Criteria</b>	In accordance with NGR 79 (2)(c) the capital expenditure is necessary: <ul style="list-style-type: none"> <li>to maintain and improve the safety of services.</li> <li>to maintain the integrity of services.</li> </ul>

**Table 57: Refurbishment of accommodation facilities**

	Project Details
<b>Scope of work</b>	Compressor station accommodation buildings to be painted internally and externally and new carpets installed. Curtains and other furnishings within the buildings also to be replaced.
<b>Justification / business need</b>	Accommodation facilities have not been significantly refitted since original construction. These facilities are used by staff that are required to man compressor stations and are located at these stations for periods of up to 11 days at a time. Expenditure is based on historical annual average expenditure.
<b>Expenditure</b>	
<b>NGR Criteria</b>	In accordance with NGR 79 (2)(c) the capital expenditure is necessary: <ul style="list-style-type: none"> <li>to maintain and improve the safety of services.</li> <li>to maintain the integrity of services.</li> </ul>

**Table 58: Upgrade of communications - Exmouth meter station**

	Project Details
<b>Scope of work</b>	Project to install standard serial communications at Exmouth Meter Station to provide fast and reliable SCADA communications. Replace communications mast which is inaccessible except via cherry picker.
<b>Justification / business need</b>	The Exmouth Meter station is serviced by a communications device that is not the current standard utilised along the DBNGP. This device is one of only two devices used for the entire DBNGP and is difficult to maintain. The device has also developed a fault and requires replacement.
<b>Expenditure</b>	
<b>NGR Criteria</b>	In accordance with NGR 79 (2)(c) the capital expenditure is necessary: <ul style="list-style-type: none"> <li>to maintain the integrity of services.</li> </ul>

**Table 59: Upgrade of communications - Maitland meter station**

	Project Details
<b>Scope of work</b>	Project to install standard serial communications at Maitland Meter Station to provide fast and reliable SCADA communications
<b>Justification / business need</b>	The Maitland Meter station is serviced by a communications device that is not the current standard utilised along the DBNGP. This device is one of only two devices used for the entire DBNGP and is difficult to maintain. It is also proposed to repaint this connection from R1/MLV 7 to R2/MLV 8 so as to free up communications capacity at MLV7 which is full and can deliver no more SCADA connections. Existing infrastructure at R2/MLV8 will be utilised to service this link.
<b>Expenditure</b>	
<b>NGR Criteria</b>	In accordance with NGR 79 (2)(c) the capital expenditure is necessary: <ul style="list-style-type: none"> <li>to maintain the integrity of services.</li> </ul>

**Table 60: Upgrade of communications - Mungarra meter station**

	Project Details
<b>Scope of work</b>	Remove and upgrade the communications to Mungarra Power Station. Installation of a communications pole at Mungarra as well as a Sagem microwave link to repeater 30. Provision of CSN, corporate and a telephone at site.
<b>Justification / business need</b>	Communications to Mungarra Power Station is slow and has limited capacity to provide a suitable control systems network, corporate or even a telephone connection.
<b>Expenditure</b>	
<b>NGR Criteria</b>	In accordance with NGR 79 (2)(c) the capital expenditure is necessary: <ul style="list-style-type: none"> <li>to maintain the integrity of services.</li> </ul>

**Table 61: Upgrade of communications system at Pinjar meter station**

	Project Details
<b>Scope of work</b>	Remove and upgrade the communications to Pinjar Power Station. Installation of a communications pole at Pinjar as well as a Sagem microwave link to repeater 41. Provision of CSN, corporate and a telephone at site.
<b>Justification / business need</b>	Communications to Pinjar Power Station is slow and limited with no ability to provide a suitable Control systems network, corporate or even a telephone connection. DBP is also unable to isolate and identify faults without the support of Western Power.
<b>Expenditure</b>	
<b>NGR Criteria</b>	In accordance with NGR 79 (2)(c) the capital expenditure is necessary: <ul style="list-style-type: none"> <li>to maintain the integrity of services.</li> </ul>

**Table 62: Installation of traffic management at CS6**

	Project Details
<b>Scope of work</b>	Civil works at compressor station including: <ul style="list-style-type: none"> <li>Provision of safe means for heavy vehicles access</li> <li>Create safe onsite parking</li> <li>Delineate High Gas Risk Areas</li> <li>Create good site drainage</li> <li>Realign internal Compressor Station roads around equipment at safe distances</li> <li>Refurbish Compressor Station road surfaces and walkways</li> <li>Create safe equipment access for routine maintenance</li> <li>Create oil storage facilities to manage environmental compliance</li> <li>Prepare pigging lay down areas for the new loop line pig launchers/receivers.</li> </ul>
<b>Justification / business need</b>	Provide safe site movement for pedestrians and vehicles.
<b>Expenditure</b>	
<b>NGR Criteria</b>	In accordance with NGR 79 (2)(c) the capital expenditure is necessary: <ul style="list-style-type: none"> <li>to maintain and improve the safety of services.</li> <li>to comply with a regulatory obligation or requirement.</li> </ul>



**Table 63: Load banks cable replacement**

	Project Details
<b>Scope of work</b>	A design issue has been identified with load bank cabling at compressor stations The internal cables are undersized and underrated for heat and cause overheating in connected equipment causing the load banks to trip. This purpose of this project is to replace load bank cabling at all compressor stations.
<b>Justification / business need</b>	The project is based on the following justification: <ul style="list-style-type: none"> <li>• Mitigate risks of fire</li> <li>• Mitigate risks of electrical shocks or electrocution</li> <li>• Reduce load bank failures</li> </ul>
<b>Expenditure</b>	
<b>NGR Criteria</b>	In accordance with NGR 79 (2)(c) the capital expenditure is necessary: <ul style="list-style-type: none"> <li>• to maintain and improve the safety of services.</li> <li>• to maintain the integrity of services.</li> </ul>

**Table 64: Upgrade of solar panels at spur sites 1 to 6**

	Project Details
<b>Scope of work</b>	This is a continuation the spur site solar upgrade project for Spur Sites 1-6. The objective is to replace the existing solar panels at spur sites and associated materials including wiring, regulators and batteries. The expenditure for this project has been phased to allow for procurement of materials during 2016 to 2018 and the installation work being carried out in 2019 and 2020 for spur sites 3, 4, and 6.
<b>Justification / business need</b>	Due to ageing and failure of existing solar panels site have become prone to power outages. To control sites remotely it is necessary to upgrade the solar power and batteries.
<b>Expenditure</b>	
<b>NGR Criteria</b>	In accordance with NGR 79 (2)(c) the capital expenditure is necessary: <ul style="list-style-type: none"> <li>• to maintain and improve the safety of services.</li> <li>• to maintain the integrity of services.</li> <li>• to maintain DBP's capacity to meet levels of demand for services existing at the time the capital expenditure is incurred.</li> </ul>

**Table 65: Upgrade of GEA 1& 2 TEM panel at compressor stations**

	Project Details
<b>Scope of work</b>	The purpose of this project is to replace the existing non-supported DEUTZ GEA TEM Control System with an equivalent digital control system. This applies to the two DEUTZ GEA's at compressor stations CS06.
<b>Justification / business need</b>	This system will no longer be supported and spare parts will no longer available for operating GEA control systems.
<b>Expenditure</b>	
<b>NGR Criteria</b>	In accordance with NGR 79 (2)(c) the capital expenditure is necessary: <ul style="list-style-type: none"> <li>to maintain the integrity of services.</li> <li>to maintain DBP's capacity to meet levels of demand for services existing at the time the capital expenditure is incurred.</li> </ul>

**Table 66: Replacement of Stage 3A turbine air inlet filters at CS4/2**

	Project Details
<b>Scope of work</b>	Installation of a new turbine air inlet filter assembly including stainless steel ducting at CS4/2.
<b>Justification / business need</b>	The existing turbine air inlet filter housings are corroding and the existing static filters are susceptible to overloading.
<b>Expenditure</b>	<b>Total: \$390,050</b> 2016 - \$390,050
<b>NGR Criteria</b>	In accordance with NGR 79 (2)(c) the capital expenditure is necessary: <ul style="list-style-type: none"> <li>to maintain and improve the safety of services.</li> <li>to maintain the integrity of services.</li> <li>to maintain DBP's capacity to meet levels of demand for services existing at the time the capital expenditure is incurred.</li> </ul>

**Table 67: Replacement of air compressors at compressor stations**

	Project Details
<b>Scope of work</b>	Replace all air compressors at compressor station sites.
<b>Justification / business need</b>	The reliability of air compressor units is imperative, as units provide the buffer air when the boost compressor is not running and pressurised. Existing units are 20+ years old and obsolete and the repair cost is more than the cost of the new unit. Upgrades include IntelliSys control which maintains remote monitoring functionality via SCADA systems. Expenditure is based on average annual historical expenditure.
<b>Expenditure</b>	
<b>NGR Criteria</b>	In accordance with NGR 79 (2)(c) the capital expenditure is necessary: <ul style="list-style-type: none"> <li>to maintain and improve the safety of services.</li> <li>to maintain the integrity of services.</li> </ul>


**Table 68: CS10/3 exhaust expansion joints replacement**

	Project Details
<b>Scope of work</b>	Replacement of CS10 unit 3 exhaust expansion joints requiring engine removal and re-installation.
<b>Justification / business need</b>	Inspections have identified deterioration in CS10 U3 exhaust expansion joint, leaks in the enclosure roof and potential damage to the exhaust collector.
<b>Expenditure</b>	
<b>NGR Criteria</b>	In accordance with NGR 79 (2)(c) the capital expenditure is necessary: <ul style="list-style-type: none"> <li>to maintain the integrity of services.</li> </ul>


**Table 69: Procurement, installation and commissioning of 4KW CCVT at MLV8**

	Project Details
<b>Scope of work</b>	This project is to supply, install and commission one 4kW closed circuit vapour turbine (CCVT) at MLV8.
<b>Justification / business need</b>	The existing CCVT is to be replaced due to the original turbine unit having failed. Reliable Power supply at MLV sites is crucial for: <ul style="list-style-type: none"> <li>The operation and control of MLVs.</li> <li>Providing TSCC (gas control) with SCADA visibility of the site.</li> <li>Powering the communications network along the pipeline to ensure less downtime and greater reliability.</li> </ul>
<b>Expenditure</b>	
<b>NGR Criteria</b>	In accordance with NGR 79 (2)(c) the capital expenditure is necessary: <ul style="list-style-type: none"> <li>to maintain and improve the safety of services.</li> <li>to maintain the integrity of services.</li> </ul>


**Table 70: Replacement of labyrinth seals on all Nuova Pignone units at CS6 and CS9**

	Project Details
<b>Scope of work</b>	Installation of Coba Seals to replace labyrinth seals on Nuovo Pignone PCL603 centrifugal compressor.
<b>Justification / business need</b>	Coba Seals were procured in FY 2013/14 to replace labyrinth type separation seals on Nuovo Pignone PCL 603 compressor. The seals were not installed due to reprioritisation of the project and deferred to 2016-17.
<b>Scope of work</b>	
<b>Justification / business need</b>	In accordance with NGR 79 (2)(c) the capital expenditure is necessary: <ul style="list-style-type: none"> <li>to maintain and improve the safety of services.</li> <li>to maintain the integrity of services.</li> </ul>

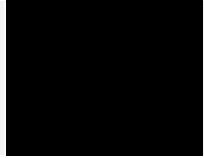
**Table 71: Upgrade of gas turbine fuel gas pressure control system**

	Project Details
<b>Scope of work</b>	Under the scope of this project, the pneumatic controllers will be replaced with Electronic transmitter. Pneumatic positioners of the control valves will be replaced with digital positioners.  The project scope includes detail engineering, procurement, site installation & commissioning, maintenance work instruction modification and hand over.
<b>Justification / business need</b>	<ul style="list-style-type: none"> <li>Current pneumatic controllers are very difficult to maintain due to their high price and expertise required.</li> <li>It is not possible to control fuel pressure within the desired band of 200 KPA. As a result, DBP has experienced tripping of units due to high T5 temperature.</li> <li>An investigation on turbine nozzle cracking suggested that fuel gas pressure variations may be a causal factor.</li> <li>The proposed conversion will provide tighter control on valve and better diagnostic / condition monitoring through SCADA.</li> <li>Upgrade will see continued standardisation with other facilities on DBNGP.</li> <li>This conversion will give accurate control, improved monitoring through SCADA and reliability of valve operation through signature analysis.</li> </ul>
<b>Expenditure</b>	
<b>NGR Criteria</b>	In accordance with NGR 79 (2)(c) the capital expenditure is necessary: <ul style="list-style-type: none"> <li>to maintain and improve the safety of services.</li> <li>to maintain the integrity of services.</li> </ul>


**Table 72: Installation of solar dynamic vibration data visibility program**

	Project Details
<b>Scope of work</b>	The staged purchase and installation of Bently Nevada FMIM's (Field Management Interface Module) to enable the collection and analysis of dynamic data from the existing machine protection racks on all Stage 4 Solar Packages, upgraded ACS Solar Packages and Stage 3A packages after the control systems upgrade.
<b>Justification / business need</b>	Section 5 of the Asset Management Plan requires that data is analysed to determine asset condition and provide information to engineering for the optimisation of asset lifecycle.
<b>Scope of work</b>	
<b>Justification / business need</b>	In accordance with NGR 79 (2)(c) the capital expenditure is necessary: <ul style="list-style-type: none"> <li>to maintain and improve the safety of services.</li> <li>to maintain the integrity of services.</li> </ul>

**Table 73: Provision of condition monitoring data visibility**

	Project Details
<b>Scope of work</b>	The staged purchase, installation and configuration of Bently Nevada System1 servers to manage the collection and analysis of dynamic data at all compressor stations. Servers will be managed as part of the control systems network.
<b>Justification / business need</b>	Integration with SCADA, station Human Machine Interface (HMI) and unit HMI's will manage machine data to be analysed and used to determine asset condition and provide information to engineering for the optimisation of asset lifecycle.
<b>Expenditure</b>	
<b>NGR Criteria</b>	In accordance with NGR 79 (2)(c) the capital expenditure is necessary: <ul style="list-style-type: none"> <li>to maintain and improve the safety of services.</li> <li>to maintain the integrity of services.</li> </ul>

**Table 74: Office 2013**

	Project Details
<b>Scope of work</b>	Upgrade the current version of Microsoft Office 2010 current version on all corporate workstations.
<b>Justification / business need</b>	Required as part of DBP's Desktop Management strategy to proactively manage and progressively upgrade the Corporate Desktop environment.
<b>Expenditure</b>	
<b>NGR Criteria</b>	In accordance with NGR 79 (2)(c) the capital expenditure is necessary: <ul style="list-style-type: none"> <li>to maintain the integrity of services.</li> <li>to maintain DBP's capacity to meet levels of demand for services existing at the time the capital expenditure is incurred.</li> </ul>

**Table 75: Workstation managed operating environment (MOE)**

	Project Details
<b>Scope of work</b>	Design, develop and implement a new Managed Operating Environment (MOE) for DBP workstations based on best industry practice.
<b>Justification / business need</b>	This is required as part of DBP's Desktop Management strategy to manage the corporate desktop environment. After transitioning to the new ICT Service Provider, establishing a new MOE to enable best practice in desktop building, deploying and maintaining workstations will minimise the amount of time, effort resources required by the ICT service provider to manage workstations across DBP.
<b>Expenditure</b>	
<b>NGR Criteria</b>	In accordance with NGR 79 (2)(c) the capital expenditure is necessary: <ul style="list-style-type: none"> <li>to maintain the integrity of services.</li> <li>to maintain DBP's capacity to meet levels of demand for services existing at the time the capital expenditure is incurred.</li> </ul>

**Table 76: Windows 8.1 desktop upgrade**

	Project Details
<b>Scope of work</b>	Currently all DBP corporate desktops operate using the Windows 7 Operating System. The intention is to upgrade all of these to the current version of Windows 8.1.
<b>Justification / business need</b>	This is required as part of DBP's Desktop Management strategy to manage our Corporate Desktop environment. Windows 7 client operating system is now two versions behind the current Microsoft OS and goes end of support in January 2015.
<b>Expenditure</b>	
<b>NGR Criteria</b>	In accordance with NGR 79 (2)(c) the capital expenditure is necessary: <ul style="list-style-type: none"> <li>to maintain the integrity of services.</li> <li>to maintain DBP's capacity to meet levels of demand for services existing at the time the capital expenditure is incurred.</li> </ul>

**Table 77: HSE intranet page enhancements**

	Project Details
<b>Scope of work</b>	Engage external web page designer to assist with the re-design of the HSE intranet page.
<b>Justification / business need</b>	Integration of InControl HSE portal with existing functionality provided by the HSE intranet website.
<b>Expenditure</b>	
<b>NGR Criteria</b>	In accordance with NGR 79 (2)(c) the capital expenditure is necessary: <ul style="list-style-type: none"> <li>to maintain and improve the safety of services.</li> </ul>

**Table 78: Upgrade of Maximo**

	Project Details
<b>Scope of work</b>	<p>DBP's asset management system is supported by a software package called Maximo. The project scope is to provide a technical upgrade to Maximo including the software and hardware. The major areas of the project include:</p> <ul style="list-style-type: none"> <li>• Establishment</li> <li>• Development</li> <li>• Build of a TEST environment</li> <li>• Testing</li> <li>• Production Build</li> <li>• DR Build</li> <li>• Trial Cutover</li> <li>• Go Live</li> <li>• Post Go Live Support</li> </ul>
<b>Justification / business need</b>	<p>Maximo will require upgrade due to:</p> <ul style="list-style-type: none"> <li>• The hardware for the Maximo Servers will be out of warranty being 5+ years old;</li> <li>• IBM's support for Maximo not likely to be sufficient;</li> <li>• Will be required to be operative with the prevailing version of Windows.</li> </ul>
<b>Expenditure</b>	
<b>NGR Criteria</b>	<p>In accordance with NGR 79 (2)(c) the capital expenditure is necessary:</p> <ul style="list-style-type: none"> <li>• to maintain the integrity of services.</li> <li>• to maintain DBP's capacity to meet levels of demand for services existing at the time the capital expenditure is incurred.</li> </ul>

**Table 79: Purchase of additional hardware and software for field interface equipment**

	Project Details
<b>Scope of work</b>	<p>Purchase of vendor software required and install on Tier 3 Field Maintenance Tools as developed by the Field Technical Services team.</p>
<b>Justification / business need</b>	<p>Software licences payments to adequately cater for Field technical services staff requirements.</p>
<b>Expenditure</b>	
<b>NGR Criteria</b>	<p>In accordance with NGR 79 (2)(c) the capital expenditure is necessary:</p> <ul style="list-style-type: none"> <li>• to maintain the integrity of services.</li> </ul>

**Table 80: Installation of additional power gas isolation valves for all MLVs**

	Project Details
<b>Scope of work</b>	Install new isolation valve and bleed plug upstream of final isolation valve on the power gas supply for all MLVs.
<b>Justification / business need</b>	Existing Nakamura Power Gas Isolation Valves do not seal unless completely overhauled regularly. New installation will have a greatly reduced maintenance frequency and will ensure that it is compliant with the DBP isolation procedure.
<b>Expenditure</b>	
<b>NGR Criteria</b>	In accordance with NGR 79 (2)(c) the capital expenditure is necessary: <ul style="list-style-type: none"> <li>to maintain and improve the safety of services.</li> <li>to maintain the integrity of services.</li> </ul>

**Table 81: Modification of instrument gas supply to MLVL actuators**

	Project Details
<b>Scope of work</b>	Re-design of MLVL (mainline valve for loopline) actuator instrument isolation and testing points including: <ul style="list-style-type: none"> <li>The addition of multipoint valves to instrumentation</li> <li>The addition of an isolation valve to the accumulator and PSV; and</li> <li>Modifications to tubing to provide safe venting of accumulators</li> </ul>
<b>Justification / business need</b>	When opened the vent point of the accumulator vents high pressure gas directly to the ground, immediately adjacent the person performing the work. This activity, which is currently required to be performed at least 70 times per year, creates an unnecessary risk to the safety of personnel and the integrity of the equipment. Further, the current configuration of MLVL actuator instrumentation tubing, etc does not allow for instruments to be isolated individually and each time maintenance is to be performed, the entire system, including the accumulator, has to be vented down.
<b>Expenditure</b>	
<b>NGR Criteria</b>	In accordance with NGR 79 (2)(c) the capital expenditure is necessary: <ul style="list-style-type: none"> <li>to maintain and improve the safety of services.</li> </ul>



**Table 82: Relocation of Jandakot gas engine alternator**

	Project Details
<b>Scope of work</b>	Relocation of Jandakot GEA from Jandakot Depot following completion of Jandakot power upgrade project. GEA to be preserved and transported to Kwinana Junction facility.
<b>Justification / business need</b>	<ul style="list-style-type: none"> <li>• GEA will be made redundant following installation of higher capacity DEA (Diesel engine alternator).</li> <li>• GEA is operational ready and reliable which can be utilised for Kwinana Junction backup power requirements. This becomes more important with the relocation of the SCADA, Corporate IT, and Corporate Telephony secondary systems to Kwinana Junction.</li> <li>• GEA can be preserved in accordance to vendor's specification and be ready for transport as required.</li> </ul>
<b>Expenditure</b>	
<b>NGR Criteria</b>	<p>In accordance with NGR 79 (2)(c) the capital expenditure is necessary:</p> <ul style="list-style-type: none"> <li>• to maintain the integrity of services.</li> <li>• to maintain DBP's capacity to meet levels of demand for services existing at the time the capital expenditure is incurred.</li> </ul>

**Table 83: Replacement of fuel gas valve hydraulic actuators with electric actuators for all Nuovo Pignone (NP) units**

	Project Details
<b>Scope of work</b>	<p>There are two turbine-compressor units on DBNGP supplied from GE-NP. One unit is at CS06 and one at CS09. Both units have been commissioned in the year 1996 as part of stage 2 expansion project. These units consist of hydraulic system to control and operate the critical turbine control equipment like IGV, Nozzle, Fuel gas valve. Due to the inherent issues with the hydraulic system (Dirty hydraulics etc.), DBP has experienced unreliable unit operation and frequently failure to start. Due to the location, the reliable operation at CS09 is vital for the delivery of gas.</p> <p>The proposed project will convert hydraulic driven actuators into electric driven actuators. The electric actuator will give more reliable operation and less failure. Also the maintenance of electrical system will be very easy compare to hydraulic system.</p> <p>All the hardware is standard and will be supplied by GE-NP. The installation and commissioning will be carried out under the supervision of GE-NP service representative. After the installation, complete unit functionality will be checked as part of site acceptance testing.</p> <p>The proposed project has been spread over four years with procurement of hardware in 1st and 3rd year and installation in 2nd and 4th year. The first installation will be carried out at CS09</p>
<b>Justification / business need</b>	<p>Justification includes:</p> <ul style="list-style-type: none"> <li>• Very difficult to maintain hydraulic system and actuator.</li> <li>• Experienced many failure to start incidents due to problem in actuators.</li> <li>• Operational reliability at CS09 is vital for gas delivery to the metro area.</li> </ul>
<b>Expenditure</b>	
<b>NGR Criteria</b>	<p>In accordance with NGR 79 (2)(c) the capital expenditure is necessary:</p> <ul style="list-style-type: none"> <li>• to maintain the integrity of services.</li> <li>• to maintain DBP's capacity to meet levels of demand for services existing at the time the capital expenditure is incurred.</li> </ul>

**Table 84: FEED study electrical isolation of all LM500s**

	Project Details
<b>Scope of work</b>	<p>There are 5 LM500 Turbine-compressor packages, located at CS#2, CS#3, CS#4, CS#6 and CS#7 on the DBNGP. Due to changes in the operation and throughput of the DBNGP, these units have been mechanically isolated.</p> <p>The electrical isolation is the next step in the decommissioning the LM 500 Units.</p> <p>The project involves the overall consolidation of all Electrical, Control and Ancillary equipment associated with the LM500 Units. Overall station operation must not be affected by the isolation and all station interfaces must be considered.</p>
<b>Justification / business need</b>	<ul style="list-style-type: none"> <li>• The maintenance of the electrical and control systems will be diminished, as equipment is isolated and de-energised.</li> <li>• Routine station checks of the LM500 equipment will not be required.</li> </ul>
<b>Expenditure</b>	
<b>NGR Criteria</b>	<ul style="list-style-type: none"> <li>• to maintain and improve the safety of services.</li> <li>• to maintain the integrity of services.</li> </ul>

**Table 85: Modification of metering on M2A meter runs**

	Project Details
<b>Scope of work</b>	Remove Flow Meters and associated over speed controllers from Kwinana Junction M2A meter station.
<b>Justification / business need</b>	The flow through M2A does not allow for useful measurement. The 3 off 12" turbine meters can be removed and returned to stock as spares.
<b>Expenditure</b>	
<b>NGR Criteria</b>	<p>In accordance with NGR 79 (2)(c) the capital expenditure is necessary:</p> <ul style="list-style-type: none"> <li>• to maintain and improve the safety of services.</li> </ul>

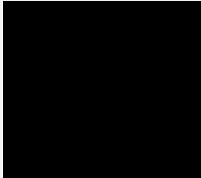
**Table 86: Installation of diesel fuel filters at bulk diesel storage tanks**

	Project Details
<b>Scope of work</b>	Install filtration on compressor station bulk diesel fuel tanks to control contamination. The filter units are to be installed on the bowser for dispensing to vehicles and gensets. Filter units with a vacuum breaker are to be installed on the tank breathers to control atmospheric ingress.
<b>Justification / business need</b>	<p>Condition sampling results of bulk fuel tanks and DEA day tanks has shown water and particulate contamination in excess of ISO and OEM recommended limits.</p> <p>Water contamination has the potential to cause bacterial infestation of diesel which can lead to fuel filter blockages.</p> <p>Particulate contamination of diesel has the potential to cause fuel filter blockages and damage to light vehicle fuel systems such as injectors and pumps. It also increases fuel consumption and exhaust particulate pollution.</p> <p>In the past 2 years there have been several bacterial infestations in DEA fuel tanks with one in particular at CS09 DEA1 which has caused an ECM fault and a subsequent delayed restart after a black site outage</p>
<b>Expenditure</b>	
<b>NGR Criteria</b>	<p>In accordance with NGR 79 (2)(c) the capital expenditure is necessary:</p> <ul style="list-style-type: none"> <li>to maintain and improve the safety of services.</li> <li>to maintain the integrity of services.</li> <li>to maintain DBP's capacity to meet levels of demand for services existing at the time the capital expenditure is incurred.</li> </ul>

**Table 87: Installation of air conditioning in PAV huts**

	Project Details
<b>Scope of work</b>	<p>Project scope includes:</p> <ul style="list-style-type: none"> <li>Install split system air conditioning to 6 Pulse Access Valve (PAV) Hut main Control Rooms that are not air conditioned.</li> <li>Decommission and remove roof ventilation fans and damper equipment from the PAV Hut main Control Rooms.</li> <li>Seal roof and damper voids.</li> <li>Update drawings and working instructions (WIs) to reflect changes</li> </ul>
<b>Justification / business need</b>	PAV huts are currently forced draft cooled. Temperatures within these huts can reach over 50 degrees Celsius in summer.
<b>Expenditure</b>	
<b>NGR Criteria</b>	<p>In accordance with NGR 79 (2)(c) the capital expenditure is necessary:</p> <ul style="list-style-type: none"> <li>to maintain and improve the safety of services.</li> <li>to maintain the integrity of services.</li> </ul>

**Table 88: Installation of remote monitoring and diagnostics for Nuovo Pignone units**

	Project Details
<b>Scope of work</b>	The purpose of this proposal is to renew the Remote Monitoring and Diagnostic Contract with GE for Nuovo Pignone Gas Turbine compressor package at CS 6 unit 2 and CS 9 unit 1.
<b>Justification / business need</b>	<p>There are currently several methods employed at DBP to collect machine diagnostic and trend data with inherent problems:</p> <ul style="list-style-type: none"> <li>• SCADA: current poll rate are not fast enough to capture transient events normally associated with turbo-machinery;</li> <li>• Remote login to the HMI via the CSN: which has security issues and the potential to trip of the unit; and</li> <li>• Periodic data collection from buffered outputs of the individual racks: labour intensive and not able to capture transient events for turbo-machinery.</li> </ul> <p>This new system has the capability to manage machine data to analyse and use to determine asset condition and provide information to engineering for the optimisation of asset lifecycle.</p> <p>The proposed system has already been in use at DBP on the Nuovo Pignone units with the now defunct control system supplied as part of the Mk6e upgrade.</p>
<b>Expenditure</b>	
<b>NGR Criteria</b>	<p>In accordance with NGR 79 (2)(c) the capital expenditure is necessary:</p> <ul style="list-style-type: none"> <li>• to maintain and improve the safety of services.</li> <li>• to maintain the integrity of services.</li> </ul>

**Table 89: Repair and replacement of exhaust systems at CS6/2**

	Project Details
<b>Scope of work</b>	The exhaust system at CS6 was temporary repaired at last overhaul. Its performance has been monitored and is now planned for replacement.
<b>Justification / business need</b>	<p>The stack shell has been identified as structurally deteriorating with multiple instances of cracking detected in circumferential strake welds, longitudinal strake closure welds and adjacent areas, instances of coating deterioration and attendant surface corrosion. These defects were identified and repaired in 2009. The root cause was attributed to leakage of exhaust gas into the annular space between the liner and shell. The exhaust gas then condenses and forms nitric acid which promotes corrosion and inter-granular SCC of the carbon steel shell.</p> <p>The stack liner appears to be structurally compromised. A visual inspection via a PTZ camera appears to indicate detachment of practically all of the liner sealing band strips in the lower half of the stack. The mineral wool insulation is being extruded from the annulus in several locations. There were longitudinal and transverse crack defects observed on several strakes in multiple locations in the lower half of the stack. Cracking was observed in the attachment welds on the turning vane assembly.</p> <p>The stack shell condition has deteriorated since the last inspection. There was evidence of cracking on several patch fillet welds, however none were considered severe enough to warrant immediate repair. In addition to the previously identified defects, there was several instances of shell buckling and one 55mm crack on the west side of the stack located on the longitudinal weld of the square to round transition section approximately 4 metres above grade.</p>
<b>Expenditure</b>	
<b>NGR Criteria</b>	<p>In accordance with NGR 79 (2)(c) the capital expenditure is necessary:</p> <ul style="list-style-type: none"> <li>to maintain and improve the safety of services.</li> <li>to maintain the integrity of services.</li> </ul>

**Table 90: Alarm management for compressor stations**

	Project Details
<b>Scope of work</b>	Purchase, install and configure Alarm Management software that includes the Alarm master database for all alarms related to HMI's at Compressor Station as part of meeting ANSI/ISA-18.2-2009, Management of Alarm Systems for the Process Industries standard.
<b>Justification / business need</b>	ANSI/ISA-18.2-2009, Management of Alarm Systems for the Process Industries standard released in 2009 has certain mandatory requirements. The standard requires an alarm master database to be kept and managed over the life of the alarms. Operators of equipment with a HMI systems and display alarms are required to meet these new standards. In addition to the alarm master database, rationalisation and auditing capabilities are also included along with appropriate reporting features.
<b>Expenditure</b>	
<b>NGR Criteria</b>	<p>In accordance with NGR 79 (2)(c) the capital expenditure is necessary:</p> <ul style="list-style-type: none"> <li>to maintain and improve the safety of services.</li> <li>to comply with a regulatory obligation or requirement.</li> </ul>

**Table 91: Conversion of logic master program into Proficy of remaining GE PLC**

	Project Details
<b>Scope of work</b>	<p>The purpose of this project is to upgrade GE Programmable Logical Control (PLC) from non-supported hardware to supported hardware.</p> <p>The upgrade will involve replacing the CPU IC693CPU331 to IC693CPU350 at the following locations</p> <ul style="list-style-type: none"> <li>• CS02 Aftercooler and Load Shed PLC</li> <li>• CS04 Aftercooler and Load Shed PLC</li> <li>• CS07 Aftercooler and Load Shed PLC</li> <li>• CS06 Air Compressor PLC</li> <li>• CS09 Air Compressor PLC</li> <li>• Dampier Facilities PLC</li> <li>• Spares at Jandakot</li> </ul> <p>Scope of Work</p> <ul style="list-style-type: none"> <li>• Supply of replacement CPUs</li> <li>• Conversion from LM90 to Proficy ME version 5.80 Sim</li> <li>• FAT PLC program</li> <li>• SAT PLC program</li> </ul>
<b>Justification / business need</b>	<p>Justification:</p> <ul style="list-style-type: none"> <li>• Most of the IC693CPU331 CPU's require firmware and recommended replacement of super cap.</li> <li>• The IC693CPU331 is no longer supported by GE Fanuc and was discontinued as at March 2008.</li> </ul>
<b>Expenditure</b>	
<b>NGR Criteria</b>	<p>In accordance with NGR 79 (2)(c) the capital expenditure is necessary:</p> <ul style="list-style-type: none"> <li>• to maintain the integrity of services.</li> <li>• to maintain DBP's capacity to meet levels of demand for services existing at the time the capital expenditure is incurred.</li> </ul>

**Table 92: Purchase of 8-10T flatbed 4WD truck with 10T Hiab crane**

	Project Details
<b>Scope of work</b>	Purchase of 8-10T flatbed truck with 10T Hiab crane.
<b>Justification / business need</b>	<p>There are a number of activities that currently require the rental of a Hiab truck:</p> <ul style="list-style-type: none"> <li>• maintenance activities required to respond to CCVT failure;</li> <li>• overhaul and replacement of 10kw GEA;</li> <li>• battery change outs at MLV;</li> <li>• pigging operations;</li> <li>• blasting and painting works at all sites;</li> <li>• ongoing potholing operations; and</li> <li>• site clean-ups.</li> </ul> <p>Hiring plant and equipment has proved to be costly and at times not available when needed. Having a flatbed crane truck that is shared across the business will deliver savings to the business compared to hiring equipment.</p>
<b>Expenditure</b>	
<b>NGR Criteria</b>	<p>In accordance with NGR 79 (2)(c) the capital expenditure is necessary:</p> <ul style="list-style-type: none"> <li>• to maintain and improve the safety of services.</li> <li>• to maintain the integrity of services.</li> </ul>

**Table 93: Nuovo Pignone Boost Compressor Maintenance Container**

	Project Details
<b>Scope of work</b>	Supply, fit out and tooling fit out of a 20ft sea-container for the storing and transporting of Nuovo Pignone boost compressor tooling.
<b>Justification / business need</b>	The tooling containers enable quick response and will ensure the maintenance department are able to complete work efficiently. As has been done with the Solar turbine tooling containers, DBP's Maintenance division can better manage Nuovo Pignone tooling and equipment for future works on the DBP improving safety and job efficiency.
<b>Expenditure</b>	
<b>NGR Criteria</b>	In accordance with NGR 79 (2)(c) the capital expenditure is necessary: <ul style="list-style-type: none"> <li>to maintain and improve the safety of services.</li> <li>to maintain the integrity of services.</li> <li>to maintain DBP's capacity to meet levels of demand for services existing at the time the capital expenditure is incurred.</li> </ul>

**Table 94: Purchase of Manitou for compressor facility**

	Project Details
<b>Scope of work</b>	The scope of this project is for the acquisition of 2 Manitou units to replace the requirement for hired forklifts that are regularly used at compressor sites.
<b>Justification / business need</b>	Machinery is critical for the operation of compressor stations and delivery of the inventory to site. Appropriate tools and equipment are essential for the effective operation and safety of personnel and their ability to respond and perform tasks efficiently.
<b>Expenditure</b>	
<b>NGR Criteria</b>	In accordance with NGR 79 (2)(c) the capital expenditure is necessary: <ul style="list-style-type: none"> <li>to maintain and improve the safety of services.</li> <li>to maintain the integrity of services.</li> </ul>

**Table 95: Upgrade of video conferencing**

	Project Details
<b>Scope of work</b>	Implement point to point video and desktop conferencing with external parties and enable the same facilities on DBP smart phones. Pilot LYNC program to be expanded to all users within DBP. Pilot users have strongly advocated that being able to share desktop and video conference with parties external to DBP.
<b>Justification / business need</b>	Improve and simplify communication with vendors and suppliers especially with respect to technical matters. Video conferencing is also considered to be a cost savings initiative.
<b>Expenditure</b>	
<b>NGR Criteria</b>	In accordance with NGR 79 (2)(c) the capital expenditure is necessary: <ul style="list-style-type: none"> <li>to maintain and improve the safety of services.</li> <li>to maintain the integrity of services.</li> </ul>

**Table 96: Provision of video conferencing at CS2, CS4, CS6, CS7 & CS 8**

	Project Details
<b>Scope of work</b>	Currently there are video conferencing (VC) facilities at CS1, CS3, CS5, CS9, Esplanade (x2) and Jandakot. This project will deliver video conferencing to the additional remote sites that do not have VC installed (CS2, CS4, CS6, CS7 and CS8). The VC equipment will connect to exiting electronic notice board screens at each of the sites.
<b>Justification / business need</b>	The existing VC equipment was installed in 2011/12 and has reduced travel requirements. A continued drive to use this technology instead of face to face should continue this trend.
<b>Expenditure</b>	
<b>NGR Criteria</b>	In accordance with NGR 79 (2)(c) the capital expenditure is necessary: <ul style="list-style-type: none"> <li>to maintain and improve the safety of services.</li> <li>to maintain the integrity of services.</li> </ul>

**Table 97: Mipela GeoSolutions X-info suite onsite implementation**

	Project Details
<b>Scope of work</b>	Implement the Mipela Geosolutions X-Info Suite to replace the existing legacy Pipeline Operations Management System (POMS) and Lands Management Systems (LMS) for the operating pipelines and future pipeline projects to reduce system management costs whilst increasing customer service levels, response timeframes, consistency and administrative transparency.
<b>Justification / business need</b>	Replacement of legacy system with the following benefits: <ul style="list-style-type: none"> <li>Improve communication and accountability</li> <li>Manage business processes efficiently</li> <li>Access securely anytime, anywhere</li> <li>Locate a single source of information that is always up to date and centrally managed</li> <li>Efficient data reporting and analysis</li> </ul>
<b>Expenditure</b>	
<b>NGR Criteria</b>	In accordance with NGR 79 (2)(c) the capital expenditure is necessary: <ul style="list-style-type: none"> <li>to maintain and improve the safety of services.</li> <li>to maintain the integrity of services.</li> </ul>

**Table 98: Repair workshop instrument clean room**

	Project Details
<b>Scope of work</b>	Construction of an air-conditioned clean room within the repairs workshop to undertake instrumentation repairs, testing and calibrations.
<b>Justification / business need</b>	The current instrument workshop area is housed within the day crew office area. Space is of a premium at the Jandakot facility and this is a cost effective way of better utilising the available space. This also enables a centralisation of repairs activities.
<b>Expenditure</b>	
<b>NGR Criteria</b>	In accordance with NGR 79 (2)(c) the capital expenditure is necessary: <ul style="list-style-type: none"> <li>to maintain and improve the safety of services.</li> <li>to maintain the integrity of services.</li> </ul>



**Table 99: Sealing of airstrip and installation of runway lighting**

	Project Details
<b>Scope of work</b>	Sealing the existing landing strips and installation of lighting to enable all weather 24/7 operation of compressor station air strips at CS1, CS2, CS3, CS4, CS5 and CS6.
<b>Justification / business need</b>	<p>Safe and reliable 24/7 all-weather access to airstrips.</p> <p>DBP is required to comply with the Petroleum Pipelines Act clause 7(1) and 7(2)(e) and (h) schedule 1, division 2, subdivision 1 of the PPA, in that:</p> <p>(1) The licensee for a pipeline operation must take all reasonably practicable steps to ensure that the pipeline operation is carried out in a manner that is safe and without risk to the health of persons engaged in the pipeline operation or other protected persons.</p> <p>(2) Without limiting the generality of subclause (1), the licensee for a pipeline operation must —</p> <ul style="list-style-type: none"> <li>• implement and maintain appropriate procedures and equipment for the control of, and response to, emergencies arising out of the pipeline operation; and</li> <li>• provide appropriate medical and first aid services at the places at which a pipeline operation is carried on.</li> </ul>
<b>Expenditure</b>	<div style="background-color: black; width: 100px; height: 80px; margin-bottom: 10px;"></div> <p>Lower expenditure in 2016 is due to transfer of costs from financial year to calendar year.</p>
<b>NGR Criteria</b>	<p>In accordance with NGR 79 (2)(c) the capital expenditure is necessary:</p> <ul style="list-style-type: none"> <li>• to maintain and improve the safety of services.</li> <li>• to comply with a regulatory obligation or requirement.</li> </ul>

**Table 100: Replacement of sacrificial anode bed on Worsley lateral**

	Project Details
<b>Scope of work</b>	Replenish the two magnesium sacrificial anode beds on the SW Cogen Lateral with fresh anodes. Installation will be performed by the Annual Survey Contractor to avoid additional mobilisation costs.
<b>Justification / business need</b>	<p>The SW Cogen lateral has two sets of ten buried magnesium anodes that reinforce the cathodic protection at a watercourse and a lake, sites WX34.004 and WX53.755. The much lower soil resistivity in these areas can prevent the impressed current cathodic protection from achieving protection potential on its own in these areas.</p> <p>The recent Annual Survey reported six of the ten anodes at WX34.004 to have failed and the remaining four to be failing.</p>
<b>Expenditure</b>	<div style="background-color: black; width: 100px; height: 30px;"></div>
<b>NGR Criteria</b>	<p>In accordance with NGR 79 (2)(c) the capital expenditure is necessary:</p> <ul style="list-style-type: none"> <li>• to maintain and improve the safety of services.</li> <li>• to maintain the integrity of services.</li> </ul>

**Table 101: New compressor station accommodation**

	Project Details
<b>Scope of work</b>	<p>The design and installation of new accommodation units at each of the compressor stations.</p> <p>The concept is to locate the accommodation building at some distance away from the compressor stations to avoid noise and heat from the compressor units as well as minimise operational risk in staying too close to the hazardous area.</p>
<b>Justification / business need</b>	<p>Currently accommodation units are located within the compressor station compound resulting in noise and heat problems for staff working and staying in the compressor station.</p> <p>Locating the accommodation building away from the compressor station will enhance the quality of life for staff and reduce operational risk imposed by noise and heat.</p> <p>Also, the existing accommodation units are aging with high yearly maintenance costs. It is expected by 2017, it will not be cost efficient to spend the increased maintenance cost compared to building new accommodation units.</p>
<b>Expenditure</b>	
<b>NGR Criteria</b>	<p>In accordance with NGR 79 (2)(c) the capital expenditure is necessary:</p> <ul style="list-style-type: none"> <li>• to maintain and improve the safety of services.</li> <li>• to maintain the integrity of services.</li> <li>• to maintain DBP's capacity to meet levels of demand for services existing at the time the capital expenditure is incurred.</li> </ul>

**Table 102: Replacement of earthing systems at main line valve and repeater sites**

	Project Details
<b>Scope of work</b>	To replace the earthing arrangements at selected Main Line Valve (MLV) sites and repeater sites where the earthing is known to be corroded or otherwise failing.
<b>Justification / business need</b>	<p>Earthing arrangements are required at DBP surface compounds in order to:</p> <ul style="list-style-type: none"> <li>• Divert lightning surges and static electricity to earth, protecting sensitive ancillary equipment;</li> <li>• Shunt excess surge energy to earth at the Intrinsically Safe energy barriers;</li> <li>• Divert induced AC from power lines to earth;</li> <li>• At sites where 240V power is present, to provide safety earthing (protective earthing and equipotential bonding) for personnel;</li> <li>• At sites where metered mains power is present, to fulfill the obligations of AS3000;</li> </ul> <p>Existing original galvanised steel site earthing can be expected to have corroded away and zinc earthing may or may not be intact depending on individual circumstances. In such cases, the existing earthing is not fit for purpose.</p> <p>The selected sites will be individually assessed and their earthing redesigned and replaced according to DBP's earthing philosophy aimed at meeting requirements the points provided above.</p>
<b>Scope of work</b>	

	Project Details
<b>Justification / business need</b>	In accordance with NGR 79 (2)(c) the capital expenditure is necessary: <ul style="list-style-type: none"> <li>to maintain and improve the safety of services.</li> <li>to maintain the integrity of services.</li> <li>to comply with a regulatory obligation or requirement.</li> </ul>

**Table 103: FEED study upgrade of water bath heater pipework**

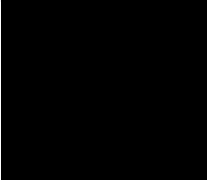
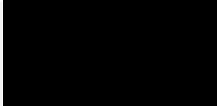
	Project Details
<b>Scope of work</b>	The FEED will include: <ul style="list-style-type: none"> <li>Design review of existing meter station water bath heaters to be carried out to develop a scope of what Heater Upgrades are required.</li> <li>To engage a gas burner specialist to review the water bath heater main burner and pilot burner control and fuel supply systems as well as the bath temperature control and monitoring systems.</li> </ul>
<b>Justification / business need</b>	The FEED study enables the risk assessment of potential approaches available and the development of budget requirement.
<b>Expenditure</b>	 <p>2016 expenditure is for the FEED study. Forecast costs in 2017 to 2020 relate to project implementation.</p>
<b>NGR Criteria</b>	In accordance with NGR 79 (2)(c) the capital expenditure is necessary: <ul style="list-style-type: none"> <li>to maintain and improve the safety of services.</li> <li>to maintain DBP's capacity to meet levels of demand for services existing at the time the capital expenditure is incurred.</li> </ul>

Table 104: Retrofitting of Remote Isolation Valves

	Project Details
<p><b>Scope of work</b></p>	<p>Retrofitting of remote operators on station isolation valves at all meter stations that have locally operated isolation valves only. These applicable sites are:</p> <ul style="list-style-type: none"> <li>• Carnarvon Power Station Meter Station</li> <li>• Eneabba Meter Station</li> <li>• Pinjar Power Station</li> <li>• Russell Road Meter Station</li> <li>• AGR Meter Station</li> <li>• Barter Road Meter Station</li> <li>• KNR Meter Station</li> <li>• Rockingham Meter Station</li> <li>• Pinjarra Town Meter Station</li> <li>• Harvey Meter Station</li> <li>• Kemerton Meter Station</li> </ul> <p>The scope of the project includes the following phases for the installation of actuators on appropriate isolation valves at the abovementioned sites, including associated communication links to allow remote operation from TSCC (Transportation Service Control Centre, DBP's gas control room head quartered in Perth):</p> <ul style="list-style-type: none"> <li>• FEED and design basis</li> <li>• Engineering and procurement</li> <li>• Construction</li> <li>• Commissioning and handover</li> </ul>
<p><b>Justification / business need</b></p>	<p>An incident occurred at the Kwinana Power Station Meter Station on 20 March 2014, involving delivery of out of specification gas into the station outlet header as a result of maintenance work being undertaken on site. The incident resulted in the delivery of gas to Kwinana Power Station above the contractual set point leading to a failure of a fitting and subsequent uncontrolled release of gas.</p> <p>Since the incident a number of improvements have been introduced including alignment of Hi and Hi Hi SCADA alarms to customer MAOP and change of philosophy by retaining the operational control (including alarm monitoring and response) from TSCC when works are undertaken on site.</p> <p>To prevent over pressurisation, TSCC will respond to Hi alarm and to Hi Hi alarm and ultimately will have the ability to respond by shutting down the isolation valve to prevent over pressurisation of the Customers' facilities.</p> <p>To enable a consistent application of alarm response across all meter stations on the DBNGP all locally operated station isolation valves are required to be retrofitted with remotely operable valves.</p> <p>The proposed improvement will enable DBP to maintain the risk level at ALARP (as low as reasonably practicable) as required by the DBNGP Safety Case during onsite activities that involve working with overpressure control devices where there is a potential human error. The proposed change will also have the added benefit of TSCC having the ability to shut down the isolation valve remotely when alarms occur during normal operation.</p> <p>The proposed works have been agreed with Department of Mines and Petroleum as part of DBP's demonstration of ALARP a requirement of the DBNGP Safety and will be specified in the next revision of the Safety Case document.</p>
<p><b>Expenditure</b></p>	
<p><b>NGR Criteria</b></p>	<p>In accordance with NGR 79 (2)(c) the capital expenditure is necessary:</p> <ul style="list-style-type: none"> <li>• to maintain and improve the safety of services.</li> <li>• to comply with a regulatory obligation or requirement.</li> </ul>

## APPENDIX A: PROJECT MANAGEMENT METHODOLOGY OVERVIEW PROCEDURE



# APPENDIX B: CONFIDENTIALITY TABLE