

**DEPARTMENT: PUBLIC ENTERPRISES**

**REPUBLIC OF SOUTH AFRICA**

**NATIONAL ASSEMBLY**

**QUESTION FOR WRITTEN REPLY**

**QUESTION NO.: PQ 3297**

**QUESTION:**



**3297. Mr E M Buthelezi (IFP) to ask the Minister of Public Enterprises:**

1. Given that the Minister of Mineral Resources and Energy recently announced that the Republic will be forging ahead with its plan to create a new state-owned power company by converting three coal-fired plants in relation to Eskom escalating the Republic to stage 6 load shedding due to the inability to prevent breakdowns at power stations, how has his department partnered with other government departments to address the operational difficulties at Eskom.
2. Whether a comparative cost analysis has been done on the feasibility of a new power company in relation to the current resources needed to financially capacitate Eskom; if not, why not; if so, what is the breakdown of such an analysis.
3. Considering the defects that occurred during the planning stages of projects at the (a) Medupi and (b) Kusile Power Stations, what are the relevant details of the steps that his department has taken to prevent a repetition of the problems that occurred at the specified power stations to occur at other power stations and the proposed new power station?

**REPLY:**

1. The Department is working closely with Eskom and other Government Departments as part of the President Action Plan to address electricity crisis in the country. DPE participates In the National Energy Crisis Committee (NECOM) workstreams that aims to improve Energy Availability Factor (EAF) to reduce loadshedding. Department of Mineral Resources and Energy (DMRE) is also part of NECOM, and the creation of the new state-owned power company is still speculative. Minister of DMRE is best placed to respond on the creation of the new state-owned power company.
2. The Minister of Mineral Resources and Energy will be appropriate to respond to the question of comparative analysis of creation of new State-Owned Company.

**According to Information Received from Eskom:**

1. *Context – key insights and lessons learnt*

Eskom has, over time, reviewed and reflected on the diverse challenges and key lessons learnt in the up-front conceptualisation, strategic decision-making, planning, and execution of the Eskom new build programme. The following Eskom key lessons and initiatives have been recognised to improve management and delivery in the Eskom new build programme and mega capital and investment projects:

* **International benchmark lesson: engineering development of mega projects**
* Adequate front-end engineering development (FEED) of mega projects: the approach taken in comparable benchmarked projects shows that investment in FEED reduces execution time, reduces capital expenditure, and increases schedule certainty.
* Key benefits of FEED are the development of comprehensive and complete engineering assumptions that significantly improve scoping, planning, plant designs, project schedule delivery, and execution integration and result in significant reduction in contractor claims and improvement in cost efficiencies through effective commercial, procurement, and tender award processes.
* **Timely up-front investment decision-making and securing of project funding**
* The decision to embark on the Eskom massive and complex new build programme, with three mega projects (Medupi, Kusile, Ingula) executed at the same time, and the national energy supply crisis of 2008 (that is, the loadshedding situation) led to the hurried executive decision for Eskom to start the construction of Medupi and Kusile power plants, which presented multiple risks, including a capital funding shortfall.The Kusile Project was suspended for several months due to a capital funding shortfall. In addition, some gaps were identified regarding a lack of suitably qualified, skilled, and experienced resources from both Eskom and contractors that were not readily available in the market (locally and internationally).
* At the time of the commencement of these mega projects, Eskom had not executed any projects of this magnitude and scale for decades, hence the lack of skills and experience. The critical skills and experience lacking from both Eskom and contractors included engineering planning and design, contracting and contracts management, commercial and procurement management, programme/project management (scheduling and monitoring), and construction management.
* Furthermore, the choice of the engineering, procurement, and construction (EPC) management multiple contracting strategy versus turnkey in the execution of the Ingula, Medupi, and Kusile Projects, to partly fulfil Eskom’s socio-economic mandate, introduced a project/contract management risk that resulted in ineffective co-ordination/management of the many contracts and contractors. The appointment of experienced and proven global execution partners was intended as a mitigation measure to provide assurance of successful delivery of the projects. Despite the appointment of the execution partners to assist Eskom, the projects experienced significant cost, schedule, and scope overruns. The cumbersome procurement approval processes in Eskom and government were a contributing factor.
* The hurried project development and shortened time spent on front-end engineering loading, with shortcuts taken in design and engineering, led to uncertainty, avoidable design changes, and integration issues, accompanied by significant mega project schedule delays, design defects, and cost escalations. The current major new plant defects are a significant consequence, impacting on the availability and reliability of the commissioned units. This situation, furthermore, led to outstanding licences and approvals that had to be obtained during the execution release approval (ERA) phase, as was the case with land acquisitions, which ultimately had a negative impact on the overall project completion time. Notwithstanding the aforementioned, Eskom managed to deliver the mega projects within the overall range of international benchmark time frames and overnight costs.
* An ineffective contracting strategy and framework, including an insufficient contractual penalties and claims management strategy, contributed to low levels of contractor performance (productivity).
* Ineffective project execution resulted in excessive cost, schedule, and scope overruns in the mega projects due to challenges and inefficiencies in several functional areas: engineering planning and design; project scheduling and controls; commercial and procurement management; contractor management and monitoring; and low levels of performance by execution partners, contractors, and Eskom staff. This inadequate project construction oversight of contractor performance resulted in significant rework (that is, major plant defects).
* Ineffective project governance, oversight, and compliance management resulted in serious non-compliance with Eskom governance processes in the areas of contracts, procurement, commercial, engineering, and National Treasury policies and guidelines, leading to the high incidence of financial irregularities, wasteful expenditure, malfeasance, and corruption.
* Ineffective management of the project statutory and regulatory requirements and risks related to safety, health, the environment, and quality, resulting in delayed project statutory and regulatory approvals (that is, water use licences, permits), with approvals obtained during the ERA phase, and leading to significant disruption and changes to the sequence of the construction schedule.
* Ineffective management of the project industrial relations and social developmental issues resulted in various site worker protests and local-to-site community protests, significantly contributing to project cost and schedule overruns.

*Steps to prevent recurrence (Eskom improvement initiatives in the management and delivery of mega projects originating from the referred-to global benchmark and new build programme lessons)*

In 2021, based on the key insights and lessons learnt from the disastrous outcomes of the execution of these mega projects, Eskom decided on the **Engineering, Procurement and Construction (EPC) lump sum (turnkey) strategy** for the execution of any future mega projects. This strategy was chosen to ensure the achievement of the best possible project results (that is, cost, schedule, scope) and to maximise the return on capital investment, while minimising risks to the owner (Eskom).

Eskom, through the EPC turnkey strategy, will **outsource the critical front-end engineering development** (FEED) scope and project execution and completion scope (construction, commissioning, and handover) to a proven, best-in-class, competent EPC turnkey contractor. The EPC turnkey contractor shall establish a **single procurement contract** to deliver the project for Eskom.

**Key benefits of the EPC turnkey strategy for Eskom:** the EPC turnkey contractor will appoint and manage subcontractors, which will address the various risks and challenges that Eskom experienced in the execution of the new build programme, while improving project delivery and improving the security of energy supply of the national grid. It will limit and avoid the reoccurrence of corruption, malfeasance, major plant defects, and reputational damage and improve the return on capital investment for Eskom. Eskom’s responsibility shall be limited to conceptual, basic engineering work as part of the Eskom project development function.

In addition, Eskom has created and implemented a project management system, informed by the high-performance utility model (EHPUM) and project life-cycle model (PLCM), with strong capabilities, processes, systems, and tools. The latter forms the basis for a structured approach to improve the management and delivery of mega capital and investment projects.

*Progress on fixing the major defects at Medupi and Kusile*

The roll-out of the major boiler plant defect solutions agreed with the contractor in 2020 for Medupi and Kusile has been completed. The results are encouraging, showing an improved average energy availability factor (EAF) of 82% over the six months (excluding Unit 4) at Medupi.

At Medupi, the gas air heater, pulse jet fabric filter (PJFF), and boiler plant modifications by the boiler contractor have been implemented on all six units, except for the long-lead milling modifications on all units and the duct erosion modifications on Unit 6.

The first phase of the roll-out (PJFF, GAH mechanical, mill short-lead items) has been completed for all Medupi units and for Kusile Units 1, 2, 3, and 4.

At Kusile, the major boiler plant modifications have been completed on four units (Units 1 to 4). Modifications on Units 5 and 6 are being rolled out during construction before commercial operation.