

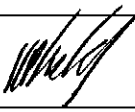
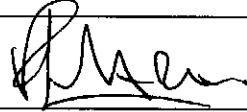



NUCLEAR 1 SITE EIA

TRANSMISSION IMPACT

ASSESSMENT

MARCH 2008

Compiled by	Reviewed by	Authorised by
		
K. Leask	R. Marais	S. Scheppers
Chief Engineer	Chief Technologist	General Manager - Grid Planning

NUCLEAR 1 SITE EIA TRANSMISSION IMPACT ASSESMENT

Table of Contents

1	BACKGROUND	2
2	LONG TERM IMPACT ON THE TRANSMISSION SYSTEM.....	5
2.1	The Thyspunt, Bantamsklip and Duynefontein Sites	5
2.2	The Schulpfontein and Brazil Sites	6
3	NUCLEAR 1 SITE INTERGRATION REQUIREMENTS	7
3.1	The Duynefontein Site	7
3.2	The Batamsklip Site.....	9
3.3	The Thyspunt Site.....	10
3.4	The Schulpfontein and Brazil Sites	12
4	COMPARSION OF SITES.....	17
5	RECOMMENDATION	19

Distribution List

Tony Stott (Entreprises Division)
Johann Breytenbach (Entreprises Division)
Dave Nichols (Entreprises Division)
Mmamaloko Seabe (Lands and Rights)
Callie Fabricius (Energy Planning)
Zaheer Kahn (Energy Planning)
Alwyn Marais (DCO)
Teresa Carolin (System Operations)
TSP Chief Engineers

1 BACKGROUND

Eskom are considering building a new fleet of nuclear power stations to meet the national demand for electricity and diversify the source of base load generation away from predominantly coal fired generation. The current proposal envisages a fleet which may eventually consist of a total of 20GW of nuclear generation.

The first phase of this nuclear programme is referred to as Nuclear 1 which will consist of either three 1100MW units or two 1600MW units, giving a total of between 3200MW to 3300MW. Eskom had already identified five potential sites for nuclear generation on the Cape coast in the early 1980s and these five sites were considered for the deployment of the Nuclear 1 units.

As a result an Environmental Impact Assessment (EIA) study has been undertaken to determine the potential impact of a 3300MW nuclear power station at the five sites. Various technical studies for the establishment of a new large power station at these have also been undertaken. The most significant impact to the Eskom system in terms of new infrastructure required is the transmission integration that will be required to absorb the power into the network and transport it to where it is needed.

An assessment study of the impact on the requirements of the transmission network for the integration of 20GW of nuclear generation at five potential sites on the Cape coast was undertaken to determine the long term implications to the Eskom system. The integration of power generation at any of the sites will involve an aspect of local integration to supply the local area network. This is common to all sites, but the complexity is unique to each site. What is of more relevance is the level of power corridor reinforcement that will be required to export the excess power out of the "local" load centre. This reinforcement of the major power corridors will be significantly higher than the local integration component and therefore have the greatest impact on the cost comparisons between the different sites.

To give an overall view of the power transfers that will occur as nuclear generation is integrated into the Cape transmission network can be simplified into a number of main transmission power corridors. This is illustrated in Figure 1 which shows the main Cape power corridors and the proposed nuclear sites.

The proposed nuclear sites are labelled on the map in Figure 1. From a Transmission impact aspect the following applies:

Site T – Thyspunt

This is a stand alone site and provides a base load generation injection into the Southern Grid which will consist primarily of the Coega, Port Elizabeth and East London loads.

Sites B and K – Bantamsklip and Duynefontein (Koeberg)

These two sites will inject into the Greater Cape Peninsula area of the Western Grid which will consist of the loads from Saldahna, Cape Town and right down to Mossel Bay. From a Transmission MW Demand balance view they can be considered to be in the same area.

Sites S and Z – Schulpfontein and Brazil

These two sites in the vicinity of Kleinsee are only 40km apart and can be considered to be electrically at the same point. There is very little local load which consists primarily of loads fed from Main Transmission System (MTS) substations at Oranjemund, Gromis and Aggeneis.

The Power Corridors

The solid lines indicate the power corridors that will be in place by 2017. These are the Main Perseus to Gamma Corridor (marked as C1), the Gamma to Cape Peninsula Corridor (marked as C2) and the Gamma to Coega Corridor (marked as C3) which make up the main Cape Corridor, the Cape Peninsula Corridor and the Southern Grid Corridor respectively. They consist of a combination of 400kV and 765kV transmission lines.

The dashed lines which are marked as A and B represent the new Power Corridors that will have to be established. This will be the West Coast to Gauteng corridor (marked as A) and the West Coast to Peninsula Corridor (marked as B). There is only a single 400kV line in this area and this is not sufficient to be considered as a major power corridor for the evacuation of base load generation.

Corridor B links the sites to the Cape Peninsula area both to provide a route for exporting power and a link for off-site supplies and system stability. Corridor A links the sites directly to the network in the north, either in the North-West or Central Grid.

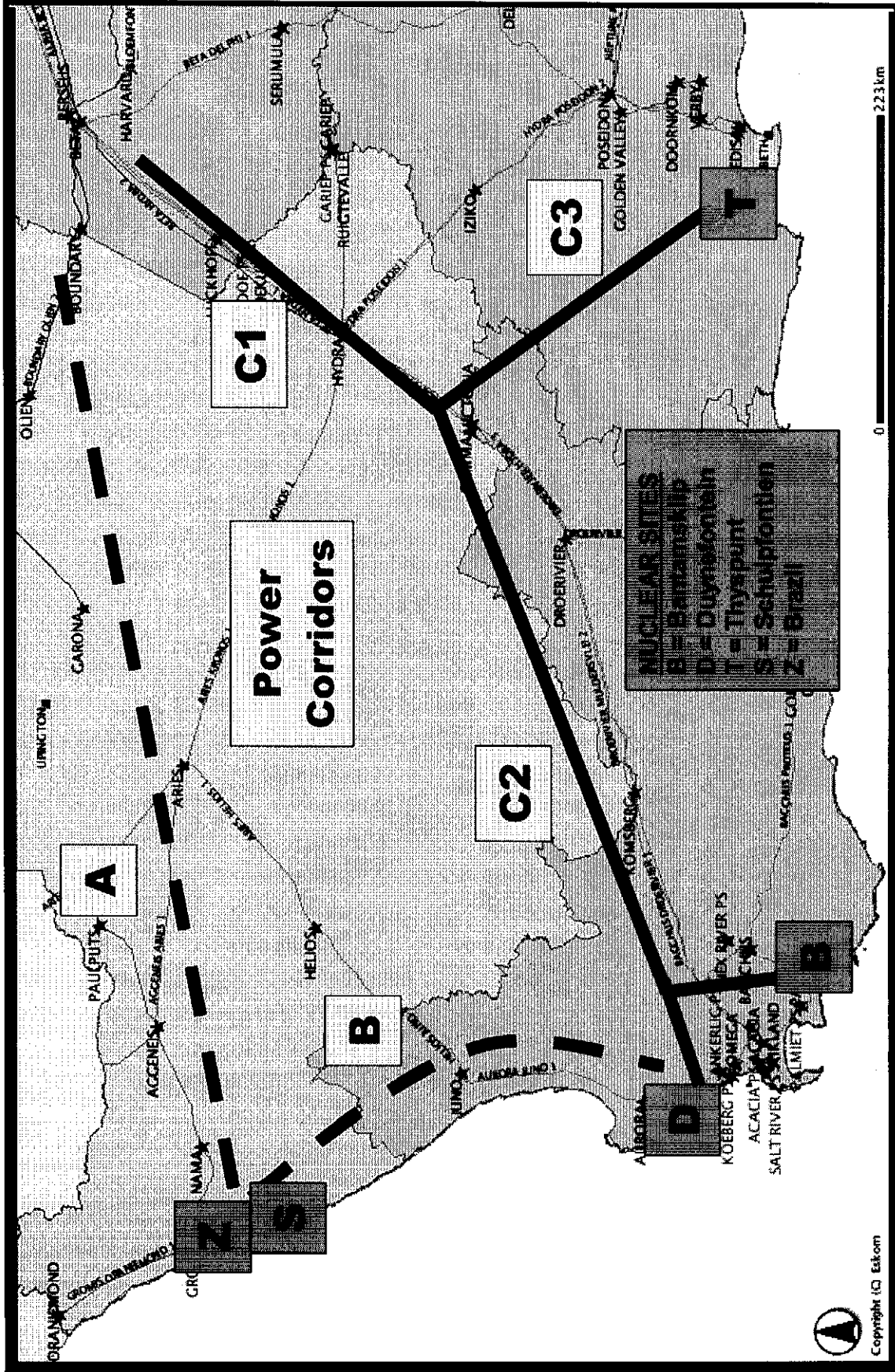


FIGURE 1: Map of the Proposed Nuclear Site Locations and Major Cape Power Corridors

2 LONG TERM IMPACT ON THE TRANSMISSION SYSTEM

The long term impact of the deployment of large nuclear generation on the Cape coast is that the Cape area as a whole will rapidly become a nett power exporter. If all 20GW of nuclear generation is deployed along the Cape then the existing power corridors between the Cape and the northern part of the country will have to be significantly reinforced to at least three times the existing 2017 capacity. This is because there is not sufficient load demand expected in the Cape area to absorb the new generation and about 12000MW to 14000MW will have be exported to the north.

The proposed five sites can be divided into two main groups, namely those that are either close to the exiting transmission infrastructure or very remote from the existing transmission infrastructure. The Thyspunt, Batamsklip and Duynefontein (Koeberg) sites fall in the first group and the Schulpfontien and Brazil sites fall in the second group. The long term impacts are summarised below.

2.1 The Thyspunt, Bantamsklip and Duynefontein Sites

At all three sites there is a need for "local" integration to inject into the local load centre. This will consist of 400KV lines to the major Main Transmission System (MTS) substation sites in the respective areas. This will be a "common" cost to all three sites, although specific to each site depending on the actual distance from the major MTS substation sites.

Provision will have to be made to link to a major Power Corridor to evacuate the excess power and export it. This connection will consist primarily of 400kV lines and possibly 765kV lines. The main issue will be the distance to the nearest Major Corridor point and the access difficulty.

Regarding the Thyspunt site the local load and Power Corridor access are at the same point electrically and will be the same cost. In other words 400kV lines will connect the to the local MTS substations and to the 765kV main power corridor substation at Grassridge on the outskirts of Port Elizabeth.

Regarding Duynefontein (Koeberg) the access will be relatively easy due to its proximity to Omega 765kV substation and relatively short distance to the next 765kV substation at Kappa. This will enable access to two major infeed points on the Power Corridor C2. At least two 400kV lines will connect to MTS substations in the Cape Peninsula area.

In the case of Bantamsklip the access to the Power Corridor C2 will be longer and more difficult. The closest will be the Kappa 765kV substation which also provides a link to local load, but access to the Omega 765kV substation will be very difficult. These lines which will be constructed at 765kV but may initially be energised at 400kV. One line may pass via the Bacchus MTS substation near Worster and be extended westwards to Muldersvlie. One or even two 400kV lines may link to the Proteus MTS substation near Mossel Bay. This 400kV line may possibly be then extended to the Droerivier substation near Beaufort West which forms part of the C2 Power Corridor to provide an alternative path to export power to the north.

Regarding the deployment of nuclear generation at these three sites only a total of between 6000MW and 8000MW can be absorbed before major reinforcement of the existing Cape power corridors will be required. This is dependant on the combination of generation units deployed at the different sites. Further deployment of units at any of the three sites will require further reinforcement of the Power Corridors which will depend on the total generation installed.

2.2 *The Schulpfontein and Brazil Sites*

Both sites will require the establishment of new Power Corridors. There is no significant local load, even including the export to NamPower. In order to safely integrate the nuclear generation the Power Corridor will have to consist of a minimum of three power lines for the initial units. The number of power lines required will increase as the number of units increase.

Corridor A will have to link the sites directly to the Central (Gauteng) or North-West Grids in order to send the power where it will be required. This will result in a Power Corridor with individual circuits of the order of 1400km to 1600km long which will require significant investment. These transmission lines could be either UHV 765kV or HVDC 600kV due to the length.

To meet the N-2 criteria for Power Corridor A the following numbers of circuits are likely to be required:

- 2 x 1600MW units (3200MW) – at least 3 circuits
- 5 x 1600MW units (8000MW) – at least 5 circuits
- 7 x 1600MW units (11200MW) – at least 6 circuits

Corridor B will link the sites to the Cape Peninsula load centre. If any of the new nuclear units are deployed in the Cape Peninsula there will be no requirement to establish a “major” power corridor to export power along Corridor B as the load demand and generation will be either balanced or with excess generation. This route will only be required to provide a secure off-site supply to the two sites and for system stability under contingency conditions. To meet this 2 x 400kV lines (each 400km long) to link to Aurora substation near Saldanha is expected to be adequate.

3 NUCLEAR 1 SITE INTERGRATION REQUIREMENTS

The assessment of the five sites for the deployment of the Nuclear 1 generators is presented in this section. The previous section put the five sites in context of the possible further roll out of additional nuclear generation units beyond Nuclear 1. The review of the sites for Nuclear 1 addresses the practical implications for the integration into the Eskom transmission system.

3.1 The Duynefontein Site

The proposed Duynefontein site is just north of the existing Koeberg power station. The new Omega 765/400kV MTS substation will be established close to Koeberg as part of the Cape Strengthening projects which forms part of the Cape Power Corridor. This site is close to the main Cape Peninsula load centre and some of the power will be directly integrated into the Cape Peninsula 400kV network to supply the growing load. The excess power will be transported to the main Eskom network via Omega for further distribution or export to the north.

The initial Nuclear 1 phase will require the following transmission integration to meet the planning criteria:

- 3x Duynefontein-Omega 400kV lines

- 1x Duynefontein-Philippi 400kV line
- 1x Duynefontein-Stikland 400kV line

The approximate line routes are indicated in Figure 2 below for illustrative purposes. The full transmission line EIA process will be undertaken to identify the possible line corridor routes as well as the potential environmental impacts thereof.

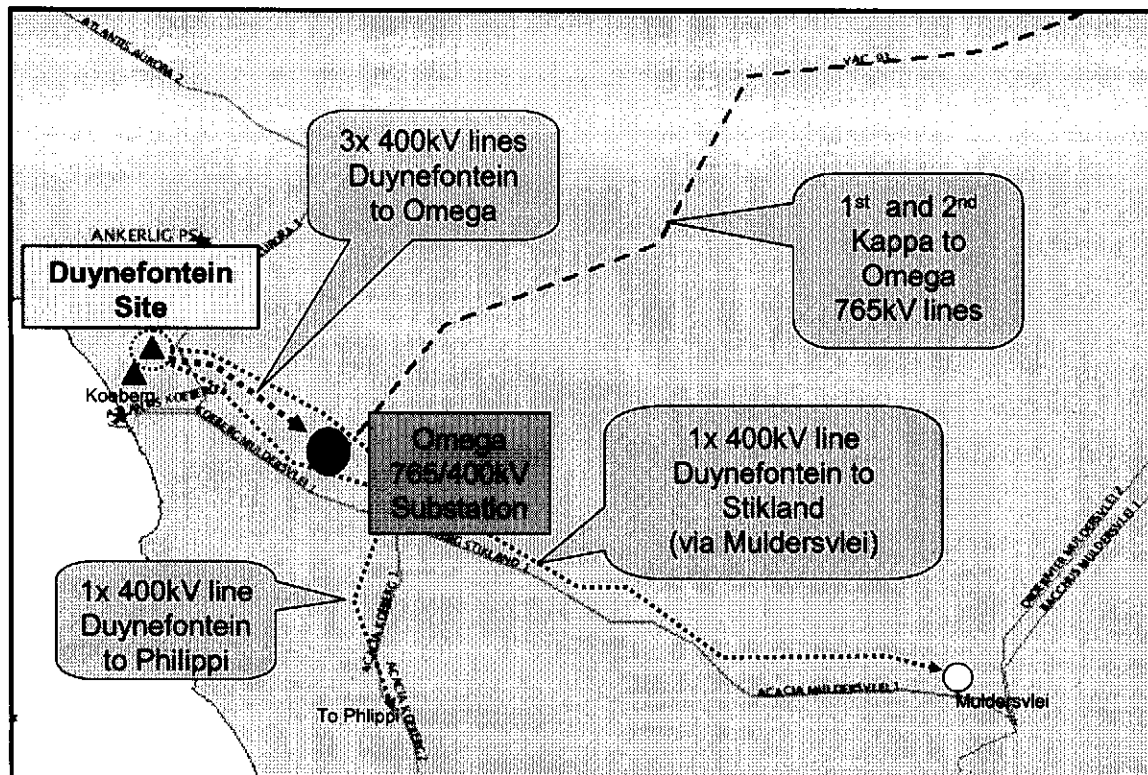


Figure 2: Nuclear 1 Transmission Line routes for the Proposed Duynefontein site

This integration will integrate Nuclear 1 into the Cape Peninsula load centre as well as link it to the existing Cape Power Corridor. The proposed Duynefontein site has two main advantages namely:

- It is close to main Cape Peninsula load centre which will help improve the dynamic stability of the new generators under contingency conditions on the transmission system (i.e loss of transmission lines)
- Increased generation in the area will improve the stability of the transmission system to the Cape under contingencies of the generators in the Cape Peninsula (i.e. loss of generators at Koeberg and Palmiet)

3.2 The Batamsklip Site

The proposed Bantamsklip site is located to the south of Cape Town near Gaansbaai. This site is relatively remote from any major load centre and a strong interconnection network with the Eskom network will have to be constructed. Most of the power will have to be can be transported to the 765kV network via the new Kappa 765/400kV substation for further distribution. Kappa will be established as part of the 765kV reinforcement scheme for the Cape Corridor network and is located near Wolseley.

The lines linked to Kappa will be constructed at 765kV to allow for future deployment of additional nuclear generator units at Batamsklip. There are capital investment advantages to initially energising at 400kV and delaying the 765kV transformation, but the detailed dynamic stability studies must be completed before selecting the voltage level for Nuclear 1. When energised at 400kV the lines will loop into the Bacchus substation near Worster to provide an infeed into the Cape Peninsula load network.

In addition one 400kV line is likely to be constructed to link to the Proteas substation near Mossel Bay in order to provide support to the loads in this area. However this is dependant on the final voltage configuration and stability requirements for Nuclear 1. If additional units are deployed at Batamsklip this 400kV line may be doubled and an additional 400kV line may be built from Proteas to link to the Droerivier 400kV substation near Beafort West which is part of the Cape Power Corridor. This will improve the transfer capacity to export the additional power to the north.

The initial Nuclear 1 phase is likely to be either of the following transmission integration to meet the planning criteria:

400kV Option

- 4x Bantamsklip-Bacchus 400kV lines (3 constructed at 765kV)
- 3x Bacchus-Kappa 400kV lines (constructed at 765kV)
- 1x Bantamsklip -Proteus 400kV lines

OR

765kV Option

- 3x 765kV Bantamsklip-Kappa 765kV lines (directly energised at 765kV)
- 1x Bantamsklip -Proteus 400kV lines (possibly)

The approximate line routes are indicated in Figure 3 below for illustrative purposes. The full transmission line EIA process will be undertaken to identify the possible line corridor routes as well as the potential environmental impacts thereof.

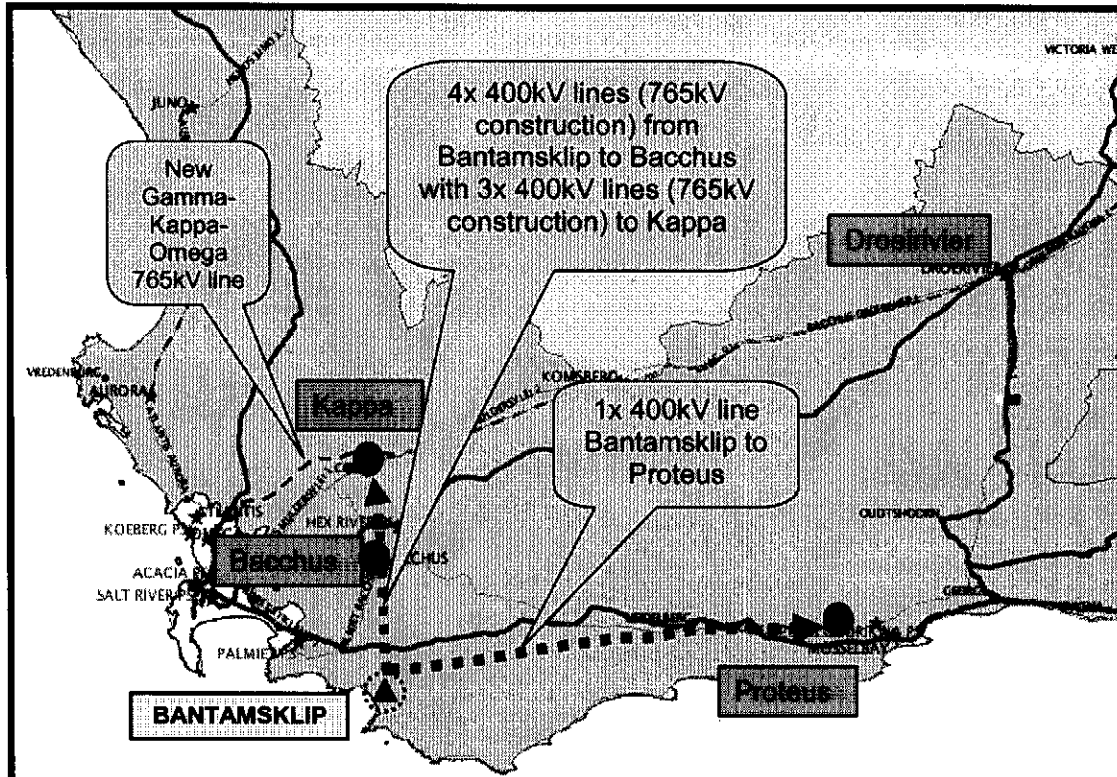


Figure 3: Nuclear 1 Transmission Line routes for the proposed Batamsklip site

The proposed Batamsklip site has similar advantages to the proposed Duynefontein site except that it is much further away for both the load centres and the main Cape 765kV corridor. Additional 765kV infrastructure is required in terms of transmission lines and a new substation where the Duynefontein site can be integrated at 400kV.

3.3 The Thyspunt Site

The proposed Thyspunt site is located to the west of the Port Elizabeth. The new Coega development will include a new 1300MW smelter and two new 765kV transmission lines will be constructed to link this area to the main Eskom network to supply the load. The proposed Nuclear 1 generation at Thyspunt will be able to link directly to this major Coega load as well as the large Nelson Mandela Bay Metropolitan (MNBM) area load.

A new substation in the west of the NMBM area (New P/E s/s) will be required for the increasing loads and will form part of the integration plan. There is no generation in this part of the Eskom network and the nuclear power station will supply all the power requirements. The excess power can be transported back into the main Eskom network via the two new 765kV lines for further distribution.

The initial Nuclear 1 phase will require the following transmission integration to meet the planning criteria:

- 2x Thyspunt-Dedisa 400kV lines
- 1x Thyspunt-Grassridge 400kV line
- New 400/132kV P/E Substation
- 2x Thyspunt-New PE S/S lines
- 1x New PE S/S-Dedisa line
- 1x New PE S/S- Grassridge line

The approximate line routes are indicated in Figure 4 below for illustrative purposes and the total length of lines is estimated at 500km. The full transmission line EIA process will be undertaken to identify the possible line corridor routes as well as the potential environmental impacts thereof.

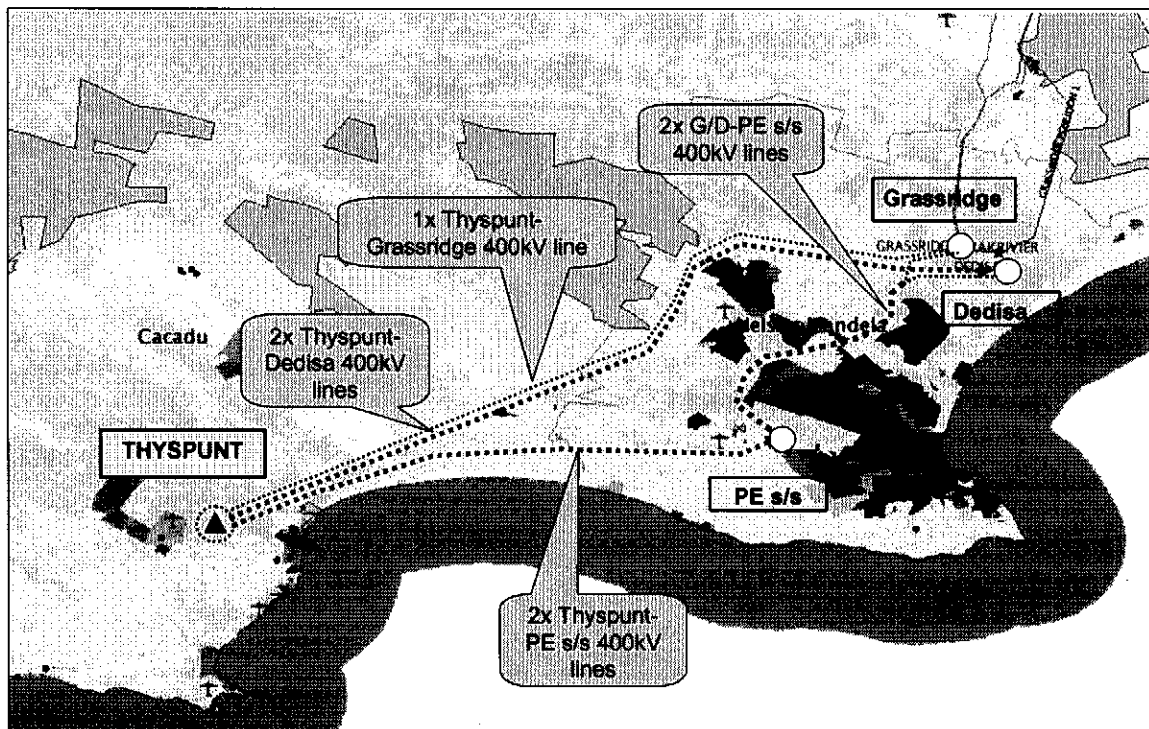


Figure 4: Nuclear 1 Transmission Line routes for the proposed Thyspunt site

The new 400kV substation in the Port Elizabeth area and the 400kV lines from the Grassridge and Dedisa substations will be required in the near future to support the growing loads. This 400kV infrastructure will be constructed even if the nuclear power station is not built at Thyspunt.

The proposed Thyspunt site has a number of advantages for Nuclear 1 namely:

- It is close to the growing Port Elizabeth load centre which will drastically reduce the total system losses.
- The load centre in turn will assist with the dynamic stability of the new generators under contingency conditions on the transmission system (i.e loss of transmission lines).
- Base load generation in the area will significantly improve the stability of the transmission system to the Eastern Cape and the Western Cape under contingencies of the generators in the Cape Peninsula (i.e. loss of generators at Koeberg and Palmiet) by providing dynamic support via the 765kV network to the middle of the overall Cape Corridor.
- The integration can be undertaken at 400kV with no 765kV required.

3.4 *The Schulpfontein and Brazil Sites*

The Schulpfontien and Brazil sites are located on the northern part of the Cape West Coast, near Kliensee. There is no significant local load, even including the export to NamPower. The two sites are around 40km apart but from a transmission system aspect they are essential at the same point on the network. Of more relevance is that the sites are extremely remote from the main Eskom transmission network and there is no significant transmission infrastructure in the area. The closest substation is the Aggeneis 400kV substation, between Springbok and Pofadder, which is a weak part of the system. Both sites will therefore require the establishment of new Power Corridors in order to evacuate the power.

With no major Load Centre close to the sites the dynamic stability of the new generators will be a very challenging technical problem to resolve. Loss of transmission lines connecting the new power station can easily result in dynamic stability of the generators. To overcome this a very robust transmission system will need to be constructed which means a large number of long transmission lines. Even

this may not be sufficient based on the size of the units and alternatives such as breaking resistors will have to be considered, which themselves are very complicated and expensive to implement.

Based on the location of the main load centres and the topography of the Eskom transmission system two new Power Corridors will need to be established. One directly to the major load centre in Gauteng, referred to as Corridor A, and a second to link to the Cape Peninsula network, referred to as Corridor B.

The map in Figure 1 earlier in the report indicates the relative location of the new Power Corridors, labelled as Corridors A and B, in relation to the existing Cape Power Corridors, labelled as Corridors C1, C2 and C3.

There is already base load generation in the Cape Peninsula area which, when all units are operating, closely match the existing load demand. Sending a large portion of the power generated at the Schulpfontien and Brazil sites down to the Cape Peninsula area will result in an excess of power in the Cape Peninsula area. This excess will have to be exported to where it is required up in the north via the existing 765kV and 400kV power corridors, C2 and C1. This will then take up some of the transfer capacity available on the C1 and C2 Power Corridors.

If any of the nuclear units from the 20GW programme are subsequently placed in the Cape Peninsula area the C1 and C2 power corridors will have to be reinforced to provide the additional transfer capacity to export the excess power. The end result is that the power generated at the Schulpfontien and Brazil sites will essentially be wheeled via the Cape Peninsula up to the northern part of the country. This is extremely inefficient and will result in excessive and unnecessary transmission losses on the Eskom system. A more appropriate and efficient strategy would be to rather develop a Power Corridor from the Schulpfontien and Brazil sites directly to where the power will be required, i.e. Corridor A, resulting in the power travelling shorter distances and significantly lower system losses.

Therefore there is no reason to establish a high transfer capability Corridor B. However Corridor B will be able to provide a secure off-site supply for the power stations and for system stability under contingency conditions both at the Schulpfontien and Brazil sites and in the Cape Peninsula. Two 400kV lines down to

the Aurora substation (each 400km long) is expected to be adequate to meet these requirements.

Corridor A will then link the nuclear power station sites directly to the northern area of the Eskom transmission network where the power will be required. The Power Corridor will have to have a high transfer capability in order to deliver the generated power. This will result in a power corridor with individual transmission lines of the order of 1400km to 1600km long which will require significant investment and time to construct. These transmission lines could be either UHV 765kV or HVDC 600kV as the length makes the HVDC option very attractive. HVDC schemes also have some advantages with respect to system stability and power flow control.

Crucial to the technology choice between UHV 765kV or HVDC 600kV will be how the nuclear generated power and Corridor A will be integrated into the Eskom network in the Central and North-Western Grids. The route that Corridor A will follow will take it through the Northern Cape, North West Province and eventually into Gauteng. There are significant potential new load developments in the North West Province and the area bordering with the Limpopo Province, particularly in the Carletonville and Rustenberg areas. The transmission integration would have to take into account how the new power stations in the north of the Limpopo Province will also be integrated into the transmission system in this area to ensure that the optimum transmission solutions are developed. Provision will have to be made for future injection points or step-down substations along the route through the North West Province.

The Corridor A route may also deviate through the Free State towards Gauteng and eventually connect with the transmission system supplying Kwazulu Natal as there is significant load growth in this province. Again how best to integrate these new transmission lines into the existing transmission system and how to plan the future transmission system to optimise the solutions will have to be investigated in much more detail and assessed against the future system requirements.

Both route alternatives will have to take cognisance of the proposed Square Kilometre Array (SKA) radio telescope project that South Africa is bidding for. The SKA will be the largest and most sensitive radio telescope ever. It is likely to consist of thousands of dishes, each 10 - 15 m in diameter. Special antenna tiles in the core of the array will form a "radio fish eye lens" for all sky monitoring at low frequencies.

This will allow many independent observations at the same time. The joint receiving area of all these dishes and panels will add up to approximately one million square metres. The SKA core array will have to be located in a remote area. This is because relevant radio emissions from the early universe are in the range of a few hundred MegaHertz, a frequency band now crowded on earth with TV and cellular telephone transmissions. Ideally, the core SKA array should be located in the centre of a 100 km diameter radio interference-free reserve, like a nature reserve. This is proposed to be located in the Northern Cape in the South African bid which will also eventually include satellite installations in the neighbouring countries.

South African and Australia are the only two countries remaining on the shortlist to site this mega telescope. A final decision on the site is expected by 2010 and construction should start in 2014. The Corridor A route and technology choice will have to ensure that they do not interfere with South Africa's chances to be successful in the SKA project as this is a Regional initiative.

There are many uncertainties with respect to Corridor A in terms of where should the corridor terminate, what technology should be selected, how will dynamic stability be ensured and what future developments should be allowed for. Although in the long term the Schulpfontien and Brazil sites may offer some interesting possibilities for development of the Eskom transmission system at this stage there is not enough confidence in the available data to make meaningful decisions for the Nuclear 1 units. The wrong decisions could be made at this stage which would be very expensive for the country due to the massive scale of infrastructure required which the country not afford.

The EIA process for the Schulpfontien and Brazil sites will however provide a lot of useful data on the environmental, social and economic impacts, both positive and negative, which can then be used to make a more informed assessment and decision with respect to establishing a transmission Power Corridor to the northern part of the country. More accurate and verifiable data will also be available for potential load developments in the North West Province to allow better transmission solutions to be identified.

The Power Corridors A and B have not yet been properly studied in any detail. Significant detailed studies are still required to identify exactly how many

transmission lines are required and where they should be interconnected in order to safely integrate any nuclear generation that may be established at the two sites.

It is expected that to safely integrate the Nuclear 1 generation the Power Corridor A will have to consist of a minimum of three transmission lines. The number of transmission lines required will increase as the number of generators at the Schulpfontien and/or Brazil sites increases beyond the Nuclear 1 units.

To meet the planning criteria for the loss of two transmission lines and still maintain full generation evacuation and system stability under contingency conditions the following transmission infrastructure will be expected to be required:

UHV 765kV Option

- 2 x 400kV transmission lines 400km long from site down to the Auroa substation (near Saldanha)
- 3 x UHV 765kV transmission lines approximately 1500km long with 765kV intermediate and terminal substations

OR

HVDC 600kV Option

- 2 x 400kV transmission lines 400km long from site down to the Auroa substation (near Saldanha)
- 3 x HVDC 600kV transmission lines approximately 1500km long with 600kV HVDC Converter stations on either ends

From a high level costing aspect the UHV 765kV option and the HVDC 600kV options are of the same order cost. This cost can then be taken into account when comparing the high level transmission option costs for the other three sites.

What will need to be determined is that the perceived benefits of locating Nuclear 1 at either the Schulpfontien site or the Brazil site will have to be able to justify the additional cost of and resources for the transmission infrastructure required for these two sites.

4 COMPARSION OF SITES

This section gives a very high level overview of the transmission integration impact of the Nuclear 1 generators at the five sites. The overview is given in the form of a table with the main issues or aspects from a transmission system viewpoint.

The comparison table is shown in Table 1 on the next page and includes the following information:

- The voltage level and total km of transmission line that will be required.
- The advantages and disadvantages to the transmission system
- The dynamic stability advantages and disadvantages

The summary table shown in Table 1 clearly indicates that there are no advantages from a transmission system aspect for the Schulpfontien and Brazil sites. In fact there are many transmission disadvantages to these two sites in terms of infrastructure required, system losses, normal operation and dynamic stability.

Eskom is undertaking the largest build programme in its history. Huge resources are required to be able to construct the new transmission infrastructure projects to extend and reinforce the Eskom transmission system as well as integrate the new power stations, excluding Nuclear 1. By selecting either the Schulpfontien or Brazil site to locate the Nuclear 1 generators will add an enormous burden of around 5000km of additional transmission line that will have to be built within the same build programme period. This represents an increase of around 35% in total transmission lines to be built in the next 10 years just for Nuclear 1. Thus these two sites place an unnecessary additional burden on the resources of the country at this stage of the network development.

Site	Duynefontein	Bantamsklip	Thyspunt	Schulfontien / Brazil
Transmission line voltage level and length requirements	400kV: 120km	400kV: 300km 765kV: 450km	400kV: 500km	400kV: 800km HVDC 600kV or 765kV: 4500km
Transmission system advantages	Adjacent to main load centre and Cape Corridor. Can use Cape 765kV lines to export power. Only 400kV infrastructure required.	Relatively close to main load centre and Cape Corridor. Can use Cape 765kV lines to export power	Adjacent to main load centre, only small excess generation resulting in significantly lower system losses. Can use Cape 765kV lines to export power. Only 400kV infrastructure required	None
Transmission system disadvantages	Existing generation close to load demand requirements therefore will need to export most of new generation power resulting in higher system losses	Excess generation as in Duynefontein. Site is some distance from 765kV Cape Corridor and will need to construct additional 765kV lines to access.	None	Generation is very remote from major load centres or main transmission infrastructure. Significant lengths of transmission lines required to integrate and very high system losses.
Dynamic Stability advantages	System stability of Cape Corridor improved	System stability of Cape Corridor improved	System stability of Cape Corridor improved	None
Dynamic Stability disadvantages	None other than impact of large unit size	May require new infrastructure to be initially energised at 765kV	None other than impact of large unit size	Significant transmission infrastructure required

Table 1: Nuclear 1 Site comparison table

5 RECOMMENDATION

Locating Nuclear 1 at either the Schulpfontien or Brazil site is not the most efficient or optimum site at this stage of the transmission network development. There will not be enough resources in the country to take on the additional transmission infrastructure projects that will be required. The new transmission lines are not likely to be completed in time depriving the country of the generation when it is required most. This will in effect be a double blow to the economy of the country.

There are too many uncertainties regarding the Schulpfontien and Brazil sites with respect to where should the new Power Corridor terminate, what technology should be selected, how will dynamic stability be ensured and what future developments should be allowed for.

It is therefore recommended that the Schulpfontien and Brazil sites not be considered for the location of the Nuclear 1 generation units.

The sites may be considered for deployment of nuclear units at a later stage once there is more confidence in the available data and the deployment strategy for a potential 20GW nuclear fleet.