PROGRESS POWER

Information Update
Electrical Connection Access Arrangements and Electrical Connection Compound Location

February 2014

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Proposal to build a gas-fired power station on the former Eye airfield, and related infrastructure

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Electrical Connection Compound Access Arrangements and Electrical Connection Compound Location
www.progresspower.co.uk

Purpose:
Progress Power Limited (PPL) has been established by Watt Power Limited (WPL) to develop a 299 MW gas-fired power plant at the former Eye airfield. The Project is required to support the UK's transition to a low carbon economy.

The Project would comprise three main elements:

- A new **Power Generation Plant,** a Simple Cycle Gas Turbine (SCGT) gas-fired power generation station capable of providing up to 299 megawatts (MW) of electricity and incorporating up to five gas turbine generators, exhaust gas flue stacks and related buildings and infrastructure
- A new **Electrical Connection** to export electricity from the Power Generation Plant to the National Grid Electricity Transmission System (NETS). This element incorporates a new underground electricity cable circuit connection, a new access road and junction, and a new **Electrical Connection Compound** (ECC) comprising a substation and sealing end compound, to enable electricity generated by the Power Generation Plant to be delivered into the NETS.
- A new **Gas Connection**, to bring natural gas to the Power Generation Plant from the National Gas Transmission System via a new underground gas pipeline and above ground infrastructure compound.

From 3 October 2013 – 7 November 2013, PPL consulted with the local community and a range of statutory consultees on the proposed Project. A Preliminary Environmental Information Report (PEIR) was published as part of this consultation which presented the results of preliminary environmental and technical studies, options for the Gas Connection, ECC location, and a layout of the Power Generation Plant Site.

At the time of the consultation exercise PPL presented two options for the location of the ECC and discussed options for a new access to it. During the consultation PPL received helpful feedback on both the location of the ECC and the new access. A full account of the consultation and PPL's responses to it will accompany PPL's development consent order (DCO) application to the Planning Inspectorate, who administer the application on behalf of the Secretary of State for Energy & Climate Change. The account will be made available to the public.

In the meantime, given the local interest in these two components of the Project, PPL is publishing this information update to explain the decisions taken by PPL on these two aspects. This update also includes information in response to questions asked during the consultation about the choice of locating the ECC near the existing overhead NETS. This update is relevant to local communities and statutory consultees and is therefore disseminated accordingly, with the approval of Suffolk County Council and Mid Suffolk District Council.

1. Electrical Connection Compound Access Arrangements

Background:

i) The PEIR stated that "The preferred access for construction staff and vehicles to the substation and electrical route connection is via A140 / Eye Road and then via Old Norwich Road during construction." The access route to the ECC would then follow the electrical connection route in an east – west linear route across agricultural fields. However, the PEIR also explained that a full assessment of suitable access arrangements and alternatives was to be undertaken as part of the Transport Assessment – this has been ongoing since the completion of the consultation exercise in November 2013.

ii) Feedback received during the PPL statutory consultation period from local residents highlighted concerns about potential disturbance from construction traffic on local access roads through the villages of Yaxley and Mellis. Respondents stated a clear preference for keeping construction traffic away from these villages. Furthermore, consultation with the local highways authority, Suffolk County Council, indicated the preferred access route to the ECC to be directly off the A140, thus avoiding traffic through Yaxley and Old Norwich Road.

iii) Traffic and transport assessments undertaken as described in the PEIR, prior and subsequent to consultation, and discussions with Suffolk County Council, indicated that an access to the ECC directly off the A140 would be a valid and safe access arrangement.

As a result of the consultation feedback and subsequent technical assessment, PPL chose to amend the access arrangements for the ECC and is now proposing a new access from the A140. This is shown in Figure 1 and described in detail below.

Access Requirements – A140 works:

Associated works on the A140 will result in a new three way highway junction (T-Junction) with 'Give Way' signals onto the A140. The A140 will be widened to provide for a right hand turn pocket lane and an area of safety hatching (known as a "ghost island") as shown in Figure 1.

1. Access works from the A140 would likely consist of on-site preparation time (approximately 4 to 8 weeks) consisting of the excavation of verges, site clearance, construction of kerbs, gulleys, utility diversions, new fence lines, sign posts and other civil works.

2. The timing of the site clearance would take into account any ecology constraints.

3. Associated works on the A140 would likely last approximately 4 weeks and may involve temporary (night time) full closure of the road; temporary diversions routes would be agreed with Suffolk County Council.

4. Traffic Management Plan to control works and traffic flows on the A140 described above and would include items such as:
    - Potential overnight (or off peak) single lane closures of the A140 through a phased approach
    - Overnight single lane closure to be accompanied by signals or convoy escorts
    - Overnight works to require illumination, speed restrictions and temporary signing

Impact of proposed A140 access on the local area:

- Temporary closure of the northern end of Old Norwich Road to motorised vehicles in order to prevent throughway to A140 (see Figure 1 for detail, including turning circle)
- Temporary disturbance to A140 traffic flows overnight for a limited time period
- Clearance and widening works to existing A140
- Potential legacy for non-motorised connectivity between both sides of the A140 through use of ghost island

Figure 1. Proposed A140 Access

Key

1. Access track to Electrical Connection Compound

2. Passing Bay

3. New 3 way junction between A140 and ECC Access

4. Gate preventing unauthorised access to ECC

5. Old Norwich Road

6. Temporary gate at north end of Old Norwich Road

7. New turning circle on Old Norwich Road

8. Ghost Island (safety cross hatching)

9. Right turn pocket lane

2. Electrical Connection Compound Location

Background:

In order to export the electricity generated by the Power Generation Plant, the Project requires a method of connection to the NETS. During the development of the Project, a number of connection options have been considered, arriving at the decision to connect via an underground cable from the Power Generation Plant Site to the existing 400 kV overhead NETS to the north of Yaxley. To connect into the existing overhead lines, an ECC is required.

Why is a Substation Needed?

In order to connect electricity generated by a power generation plant to the electricity network, a substation is required. Substations are part of the electrical generation, transmission and distribution system. They transform voltage from low to high, or the reverse, and perform circuit switching. All power stations, except small scale standby generators, need substations and network infrastructure to operate. Regardless of the method of connection the proposed Project design would incorporate a substation.

Method of Connection – Distribution Network or National Electricity Transmission System

To export the electricity generated by the Power Generation Plant to the network an electrical connection is required to either the local electricity distribution network (DN) operated by UK Power Networks (UKPN) or the NETS operated by National Grid Electricity Transmission (NGET). Proximity to the NETS was part of the reason for selecting the Power Generation Plant Site, nonetheless, a connection to the DN was considered.

A connection to the DN had been ruled out prior to the consultation exercise but questions were asked in consultation about this option so an explanation of the reasoning is provided in this information update. There are no adequately rated 132 kV circuits in the Eye area for connection. Instead, the three theoretically possible DN connections (for a continuous firm connection under all seasonal conditions) are all at a significant distance from the Power Generation Plant Site, ranging from a minimum connection distance of approximately 28 km to a maximum of approximately 34 km. An attempt to achieve a connection of this length would cause significant disruption and environmental impact whether achieved using an underground cable or an overhead line. In addition, a connection to the DN would require extensive network upgrades to be carried out by UKPN resulting in a connection cost far greater than that required for a connection to the NETS.

As a result, a connection to the NETS was selected as the preferred option. There are existing NGET operated overhead high voltage 400 kV transmission lines within 1.5 km of the Power Generation Plant Site, to the west of the A140 that could provide a connection point.

Location of the Substation - Connection to the National Electricity Transmission System

It is important to note that the connection from existing overhead NETS to the substation has to adhere to the NGET Great Britain Security and Quality of Supply Standard (GB SQSS). GB SQSS regulates the security of electricity supply across the UK, and in doing so, also dictates the design and cost of NETS components. The Project is intended to supply electricity to the wider network and the design of its connection to the NETS is therefore governed by GB SQSS.

The next stage in the iterative design process regarding connection options was to determine where the substation should be located. Two options were available

(1) Bring the NETS 400 kV line to the Power Generation Plant Site which would allow the substation to be located on the Power Generation Plant Site; or
(2) Locate the substation adjacent to the 400 kV overhead lines and bring the 299 MW generated by the Power Generation Plant to the existing network.

Each of these connection options were under consideration when the Project Scoping Report was published in May 2013.

Bringing the 400 kV line to the Power Generation Plant Site had been ruled out prior to the commencement of the October/November consultation period, but as questions were asked during consultation about this option an explanation of the reasoning is provided in this information update.

If the ECC were to be located on the Power Generation Plant Site, NGET would have to construct a new 400 kV connection from the existing overhead NETS eastwards across the A140 to the Power Generation Plant Site. This could be achieved in two ways:

(1)

a) Creation of a dual circuit turn in. This option would require the creation of two parallel 1.5 km 400 kV double circuit overhead lines, similar in appearance to the existing high voltage lines west of the A140, leading from the existing NETS to the Power Generation Plant.

b) Creation of two 400 kV underground cable transmission circuits (consisting of 9 cables per circuit, 18 cables in total) approximately 1.5 km in length between the existing overhead lines of the NETS and the Power Generation Plant Site. Modification works would be required to the NETS, constructing a new terminal tower to provide downlead connections to bring the overhead lines down to two new sealing end compounds (SEC). Each SEC will be approximately 25 m x 45 m, and be fitted with landing gantries (small towers approximately 12.5 m in height). The SECs allow for the transition of the overhead circuit into underground cable circuit.

Option (1) (a) listed above was discarded as an unsuitable connection option due to the anticipated environmental impact and commercial considerations. The primary environmental impact of concern in regards to connection option (1) (a) was the potential for significant adverse visual impacts which would extend beyond the immediate area of the Project. The visual impact of several additional pylons between 60 – 80 m in height between the existing overhead transmission lines and the Power Generation Plant Site would be impossible to mitigate. Concerns about the potential adverse effects of new pylons were repeatedly raised during consultation with local authorities; for example:

- April 2013: Mid Suffolk District Council made it clear that any proposals including additional overhead lines to connect the Power Generation Plant to the NETS would be strongly opposed.

- May 2013: County, District and Parish Councillors raised concerns regarding the construction of additional pylons at public exhibitions held in Eye, as well as at briefings given to them prior to, and during, the exhibitions.

- June 2013: Scoping Opinion from PINS and feedback from consultees indicated that undergrounding cables was the favoured option. Norfolk County Council's response recommended the undergrounding of any electrical connection. Suffolk County Council expressed a strong preference for an underground electrical connection.

- National Grid Consultation: National Grid carried out a nationwide public consultation on the topic of underground cables versus overhead lines between December 2010 and July 2011. Respondents to this consultation demonstrated strong support for underground cabling.

Furthermore, the cost of constructing a new 400 kV overhead line dual circuit turn in to the Power Generation Plant Site would be prohibitive. It was considered that connection option (1) (a) would not be appropriate and was discarded.

Option (1)(b) listed above was also discarded following publication of the Scoping Report, at an early stage in the development of the proposals due to environmental, technical and commercial considerations. It would have the greatest ecological impact requiring two trenches at least 12 m in width, with a minimum separation distance of 5 m between the two trenches, thus requiring a working corridor of at least 29 m in width (excludes temporary working area for storage and spoil deposits). Each trench would be laid with 9 cables, representing two 400 kV circuits. Trenching (or directional drilling) across the A140 would also be required, resulting in significant disruption to A140 users including possible road closures. There would also be a requirement for two SECs to be positioned adjacent to the existing NETS. This is the most technically difficult option for connection, and the most expensive.

It is likely that the excessive cost of connection options (1) (a) and (b) would result in it being blocked by the Department of Energy and Climate Change (DECC) and the energy regulator Ofgem as it would likely result in unjustifiable costs being passed to the consumer.

Due to the factors discussed above, the location of the substation on the Power Generation Plant Site was discarded as a connection option. The preferred option was to locate the substation adjacent to the NETS 400 kV overhead lines. Locating the substation next to the NETS lines allows for the use of a single circuit of electricity, a 400 kV rated cable, to carry the 299 MW from the Power Generation Plant to the NETS. This method of connection reduces the scale and cost of the connection works and the anticipated associated environmental impacts.

Electrical Connection Compound Design – Substation and Sealing End Compound

In order to achieve connection Option (2) and transport the 299 MW of electricity generated by the Power Generation Plant to the NETS overhead lines, a substation would need to be constructed adjacent to the overhead lines in order to "tap into" the NETS. This would be the case for either an underground connection or overhead line connection. In order to reduce the visual impact of the Electrical Connection, and in keeping with feedback received following the publication of the Scoping Report in May 2013, PPL took the decision to underground the Electrical Connection. This would avoid

in combination the visual impact effects of a new substation and two additional SECs adjacent to the NETS, as well as additional pylons leading from the Power Generation Plant to the substation.

PPL also took the decision to "transform" up the voltage to 400 kV at the Power Generation Plant Site, meaning that there was no need to have a transformer on the substation site, thus reducing the footprint and potential noise output of the substation.

To export electricity generated by the Power Generation Plant to the NETS via an underground connection to the NETS overhead lines, an ECC is required.

The ECC comprises a substation with maximum dimensions 150 m x 150 m, maximum height 12.5 m situated immediately to the east of the 400 kV line, and an SEC with dimensions approximately 45 m x 22 m, maximum height 12.5 m and situated to the west of the line.

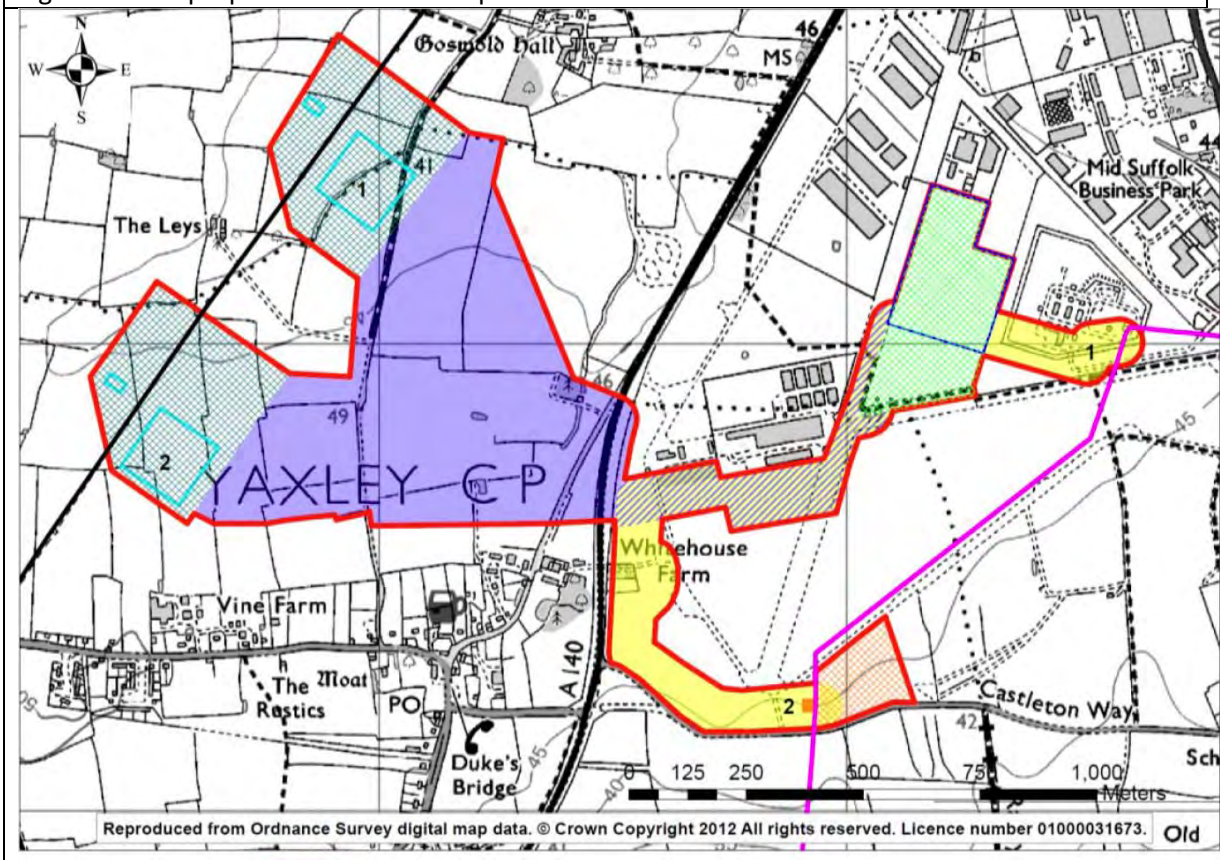
Substation Location Options selected for the PEIR

During the statutory consultation period, PPL presented two preferred ECC location options in the PEIR. Both locations were sited close to the existing 400 kV NETS, connecting to the Power Generation Plant via an underground cable. Figure 2 shows the two ECC options proposed in the PEIR. The two PEIR ECC location options were selected from an "Electrical Opportunity Area" proposed in the Scoping Report.

As decisions about the exact nature and location of the connection for the Project had yet to be made in May 2013, the "Electrical Opportunity Area" presented in the Scoping Report stretched from the Power Generation Plant Site in the east to just beyond the existing 400 kV overhead lines in the west, and from just north of Yaxley in the south to Malting Farm in the north. A connection to the NETS via an ECC situated adjacent to it could theoretically be achieved anywhere along the 400 kV NETS located within the Electrical Opportunity Area. However, a number of determining factors emerged as a result of environmental and technical studies leading to the selection of two separate preferred ECC location options. The two preferred options were presented in the Progress Power PEIR in October 2013.

A combination of ecological and cultural heritage constraints led to the elimination of all Electrical Opportunity Area land to the north of Goswold Hall. Due to the cluster of properties at The Leys, the remaining Electrical Opportunity Area land was further subdivided naturally into two separate potential ECC option areas. Furthermore, it was necessary to ensure that the two remaining option areas presented in the PEIR would not be capable, if ultimately selected, of interfering with the access road used to access the properties at The Leys. Please see the PEIR preferred ECC location options in Figure 2.

Figure 2. PEIR proposed ECC location options



- Proposed Redline Boundary (Incorporating alternative Options)
- 400kV Overhead Line
- National Gas Transmission System
- Power Generation Plant Area (Inc Laydown & Maintenance)
- Preliminary Preferred Location of the Power Generation Plant
- Substation & SEC Area Options 1 & 2 (Inc Laydown Area)
- Preliminary Preferred Locations for Substation & SEC Options 1 & 2
- Gas Above Ground Infrastructure for Option 2
- Gas Above Ground Infrastructure Laydown Area
- Electrical Connection Route Corridor Options
- Overlap between Electrical and Gas Connection Corridor Options
- Gas Connection Route Corridor Options 1 & 2

Selecting the Electrical Connection Compound Location

During the statutory consultation period, PPL invited feedback from consultees about the preferred ECC location. Two potential ECC locations were identified, Option 1 to the north and Option 2 to the south. Both locations were sited close to the existing 400 kV NETS, connecting to the Power Generation Plant via an underground cable.

157 separate responses were received from the local community during the consultation period. Of these, 21 respondents commented on the ECC location. Approximately half of the 21 respondents expressed a preference for siting the ECC at the Power Generation Plant Site.

- Two respondents noted that siting the ECC on the Airfield would likely be more acceptable to communities.
- Approximately a fifth of respondents queried why the ECC on the Airfield had not been considered as an option, with one respondent also stating that it should be consulted on.
- One respondent stated that two options for the ECC on the Airfield site had not been considered: one with an overhead connection and one with an underground connection.

For the reasons discussed above, these options had previously been given serious consideration by PPL but were not consulted on as they were not deemed to be viable.

Of the two potentially viable options that were proposed in the PEIR, seven respondents expressed a preference for ECC location Option 1, and one stated that they were not in favour of Option 1. Three respondents expressed a preference for ECC location Option 2, with one respondent stating he/she was against that option, highlighting the potential negative impacts on his/her properties.

To determine the final location of the ECC, these consultation responses were taken into consideration alongside the results of the detailed environmental and technical studies. The following environmental and technical aspects have been analysed in the selection of the ECC location:

- Air Quality
- Noise and Vibration
- Ecology
- Water Quality, Resources and Flooding
- Geology, Ground Conditions and Agriculture
- Landscape and Visual Impact
- Traffic, Transport and Access
- Cultural Heritage and Archaeology
- Socio Economics

Conclusion

Following the analysis, it is considered that both options have the potential to give rise to adverse effects on visual amenity and landscape character. On balance, it is considered that Option 2 has the greater potential for adverse visual impacts (it is closer to residential receptors and potentially more exposed) and landscape impact (due to existing field boundary structure). However, it is also recognised that mitigation in the form of landscaping would be available and effective.

It is also considered that Option 1 has the potential to give rise to adverse effects on: an established watercourse which would require diversion and have consequences on the wider drainage network; public right of way which is an ancient Green Lane and would require diversion; mature trees and hedgerows and associated habitat (including biodiversity adjacent to the Green Lane) which would require removal; and buried archaeology. As well as the environmental implications, it is considered that the potential adverse impacts associated with Option 1 (in particular the watercourse and drainage effects) have the potential to increase the technical difficulty and costs of development.

In view of the availability of mitigation for landscape and visual impacts, and the greater number of potentially adverse effects associated with Option 1, and the absence of other differentiating factors, Option 2 (the southern site) has been selected for the ECC location. An indicative drawing of the proposed ECC access track is shown in Figure 3.

Figure 3. Indicative Drawing of ECC and Access Track

Key

1.Sealing End Compound

2. Substation

3. Substation access point

4. ECC access track

5. New A140 Access

Note:

1. Figure 3 shows the relocation of a pylon. National Grid would be responsible for these works, the detail of which is still to be finalised. This is an indicative drawing of a possible solution.

2. Landscaping and screen planting shown in Figure 3 is subject to further discussions with local authorities and other consultees.

How to get in touch:

PPL welcomes feedback and comment from local communities and organisations. The non-statutory information update period runs from 6 February – 6 March 2014, and contact details are provided below. Please include your name and an address. Responses may be made public, subject to data protection laws.

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