SP Energy Networks
Transmission Owner Reinforcement Instruction (TORI)
Quarterly Update Report
April 2019 – June 2019

View of the recently installed 275kV WA Overhead Line between Coylton and New Cumnock substations

SPT-RI-001(a)	Beauly Denny 400kV Reinforcement
OVERVIEW OF WORKS Construction of a 400,000 volt double circuit overhead transmission line from Denny North to the SP Transmission/SHE Transmission boundary, forming part of a Supergrid connection from Denny North substation in the SP Transmission area to Beauly substation in the SHE Transmission area (via Braco, Errochty, Fort Augustus and Fasnakyle). One circuit on the new overhead line will operate at 400,000 volts, while the other will operate at 275,000 volts. This connection will replace that part of the existing Bonnybridge to Braco 132kV double circuit overhead line within the SP Transmission area Construction of Denny North 400,000/ 275,000/ 132,000 volt substation.	
Programme	Completion:- July 2016 DENN-BONN 132kV infeed Beauly to Denny 275kV/400kV circuit energised Nov 2015 132kV wirescape rationalisation works completion planned for December 2019. Visual mitigation works planned for completion March 2020.
Progress	Design & Consenting Complete Detailed Engineering Complete Tendering Complete Construction SGT3 circuit energised August 2016. 1st phase of visual mitigation concluded. 2nd Phase in delivery. 132kV wirescape cable civil ducting works underway. Some challenges in relation to cable routing due to land contamination Visual Mitigation works ongoing. New 275kV circuit energised 9th November 2015 New 400kV circuit energised 19th November 2015 Link to related info http://www.spenergynetworks.co.uk/pages/beauly_denny_overhead_line_upgrade.asp

SPT-RI-003	Denny-Strathaven 400kV Reinforcement ENSG Central Scheme

OVERVIEW OF WORKS

Construct a new 400,000 Volt double circuit overhead line from Bonnybridge to Newarthill and reconfigure associated sites to establish a fourth north to south double circuit Supergrid route through the Scottish central belt.
One side of the new overhead line will operate at 400,000 Volts, the other at 275,000 Volts. This reinforcement will establish Denny-Bonnybridge, Bonnybridge-Wishaw, Wishaw-Strathaven No.2 and Wishaw-Torness 400,000 Volt circuits, and a Denny-Newarthill-Easterhouse 275,000 Volt circuit.

This will be updated in 2019 following the outcome of the 2018 NOA process.

Programme	Completion:- TBC subject to Network Options Assessment (NOA) Process and potential Ofgem Strategic Wider Work (SWW)
Progress	Design Ongoing subject to Network Options Assessment (NOA) Process and potential Ofgem Strategic Wider Work (SWW) Consenting Subject to Network Options Assessment (NOA) Process and potential Ofgem Strategic Wider Work (SWW) Detailed Engineering Subject to Network Options Assessment (NOA) Process and potential Ofgem Strategic Wider Work (SWW) Tendering Subject to Network Options Assessment (NOA) Process and potential Ofgem Strategic Wider Work (SWW) Construction Subject to Network Options Assessment (NOA) Process and potential Ofgem Strategic Wider Work (SWW) Commissioning/Close Out Subject to Network Options Assessment (NOA) Process and potential Ofgem Strategic Wider Work (SWW) Link to related info https://www.spenergynetworks.co.uk/pages/network_reinforcement_and_modernisation.aspx

SPT-RI-004	Denny-Kincardine 400kV Reinforcement (East Coast Phase 1 Reinforcement and Re-Profiling)

OVERVIEW OF WORKS

SP Transmission works associated with SHE Transmission East Coast Phase 1 Reinforcement (reference SHET-RI-009) and SHE Transmission East Coast Re-Profiling (reference SHET-RI-097), comprising:

- Uprating of the existing Kincardine-Tealing/ Kintore (XL)1 overhead line route from 275kV 50oC operation to 275kV 65oC operation between Kincardine and the SP Transmission/ SHE Transmission border;
- Protection and control works at Kincardine 275kV Substation associated with the development of the SHE Transmission Alyth 275kV Substation;
- Increasing the maximum operating temperature of the Longannet-Mossmorran-Westfield-Tealing 275kV overhead line routes to 65oC, and replacing the associated 275kV cable sections at Longannet to match the increased overhead line rating; and
- Terminate the existing Windyhill-Lambhill-Longannet 275kV circuit in Denny North 275kV Substation, creating Windyhill-Lambhill-Denny North and Denny North-Longannet No.2 275kV circuits.

This will be updated in 2019 following the outcome of the 2018 NOA process.

Programme	Completion:- TBC subject to Network Options Assessment (NOA) Process and potential Ofgem Strategic Wider Work (SWW)
Progress	Design Early Engineering Design complete, detailed design ongoing Consenting Subject to Network Options Assessment (NOA) Process and potential Ofgem Strategic Wider Work (SWW) Detailed Engineering Subject to Network Options Assessment (NOA) Process and potential Ofgem Strategic Wider Work (SWW) Tendering Subject to Network Options Assessment (NOA) Process and potential Ofgem Strategic Wider Work (SWW) Construction Subject to Network Options Assessment (NOA) Process and potential Ofgem Strategic Wider Work (SWW) Commissioning/Close Out Subject to Network Options Assessment (NOA) Process and potential Ofgem Strategic Wider Work (SWW) Link to related info http://www.spenergynetworks.co.uk/pages/east_coast_400kv_reinforcement_project.asp

SPT-RI-028	North Argyll Reinforcement: Dalmally Windyhill 275kV Reconfiguration

OVERVIEW OF WORKS

As part of its non-load related asset modernisation programme, SPT will replace and reconfigure Dalmally 275kV substation to a double busbar arrangement (Scope 1).

As part of its non-load related asset modernisation programme, SPT will uprate the overhead line conductor between Dalmally and Windyhill (Scope 2).

As part of a joint SPT/ SHE Transmission project to reinforce the transmission network in north Argyll and accommodate proposed renewable generation schemes, SPT will extend Dalmally 275kV Substation and install two new double busbar bays to provide SHE Transmission with two 275kV points of connection at Dalmally 275kV Substation (Scope 3).

Programme	Completion:- Scope 1 Complete Scope 2 September 2019 Scope 3 October 2023
Progress	Design Scope 1: Complete Scope 2: Complete for reconductoring works / design evaluation in progress for remaining clearance infringements. Scope 3: In progress Consenting Scope 1: Not required Scope 2: Complete / further consent may be required for access road construction in National Park in order to resolve remaining clearance infringements. Scope 3: Not commenced Detailed Engineering Scope 1: Complete Scope 2: Complete / to complete for remaining clearance infringements. Scope 3: Not commenced Tendering Scope 1: Complete Scope 2: Complete / pending clarification on clearance infringements works, Scope 3: Not commenced

	Construction Scope 1:Complete Scope 2: Complete (excluding clearance infringements works) Scope 3: Not commenced Commissioning/Close Out Scope 1: Complete Scope 2: September 2019 completion (excluding clearance infringements works) Scope 3: Not commenced

SPT-RI-123	West Coast HVDC Link
OVERVIEW OF WORKS Installation of a 2.25GW predominantly submarine HVDC link (the Western HVDC Link) from a new 400kV substation in the Hunterston area in Scotland to Deeside 400kV substation in England. A new 400kV GIS substation, known as Hunterston East 400kV Substation, will terminate the northern end of the Western HVDC Link.	
Programme	Completion:- October 2018 and final commissioning to be completed 2019.
Progress	Design & Consenting – Complete Detailed Engineering – Complete Tendering - Complete Construction At Converter Station Civil Ground works – Complete Buildings – 90% Complete Manufacturing –Complete GIS Switchgear Installation – Complete Converter Transformers Installation - Complete Commissioning/Close Out During S2 Commissioning (Power Transmission Testing) a component failure was experienced at the Hunterston converter station. Remedial works associated were completed in March 2018. Works were progressed to make power available on a monopole configuration. The link went into operation on 7th December 2017. Commissioning testing of the bipole configuration to make the full 2.25GW operational from Hunterston to Flintshire Bridge was completed in September 2018. DC cable faults occurred in Quarter 2 & Quarter 3 2018. The cable repair was completed and the link put into bipole operation on the 16th October 2018. Link to related info http://www.spenergynetworks.co.uk/pages/western_hvdc_link.asp

SPT-RI-124	400kV GIS substation in Torness Area

OVERVIEW OF WORKS

A new 400kV double busbar substation, utilising Gas Insulated Switchgear (GIS), will be established in the vicinity of Torness. This new substation, known for the purposes of this TO Reinforcement Instruction as 'Branxton 400kV Substation', and associated plant and apparatus, will provide four Transmission Interface Points to which the Firth of Forth offshore transmission system assets will connect.

Programme	Completion:- April 2023
Progress	Design Currently working on finding the optimal location for the substation. An environmental contract has been placed to complete this exercise. Consenting Initial site selection works completed and currently under review. Detailed Engineering Still to be commenced Tendering Still to be commenced Construction Still to be commenced Commissioning/Close Out Still to be commenced Link to related info http://www.spenergynetworks.co.uk/pages/substation_modernisation_and_reinforcement.asp

SPT-RI-125	**Thornton Bridge Torness Cables**
OVERVIEW OF WORKS Following an outage of the Smeaton / Fallago 400kV circuit or the Smeaton SGT2 transformer, the existing 400kV cable between Torness / Crystal Rig may become overloaded. To prevent an overload on the Torness / Crystal Rig 400kV cable circuit, it is proposed that this Thornton Bridge / Torness 400kV cable will be uprated.	
Programme	Completion:- December 2021
Progress	Design Early engineering design phase complete Consenting Identifying affected landowners and enabling initial discussions Detailed Engineering Ongoing Tendering Still to be commenced Construction Still to be commenced Commissioning/Close Out Still to be commenced Link to related info http://www.spenergynetworks.co.uk/pages/network_reinforcement_and_modernisation.asp

SPT-RI-126	East Coast HVDC Link

OVERVIEW OF WORKS

Installation of an approximate 200km, 2GW VSC HVDC link between the Torness area (Branxton 400kV Substation) in South East Scotland, and Hawthorn Pit in North East England. Complete associated AC onshore reinforcement works at both terminals.

These works are subject to NoA process, scope, costs and program are subject to review and change. A "proceed" direction was made in the January 2018 NOA and a joint TO project team has been established to progress optioneering with a view to submitting a strategic wider work (SWW) initial needs case in 2020.

Programme	Completion:- TBC subject to Network Options Assessment (NOA) Process and potential Ofgem Strategic Wider Work (SWW)
Progress	Design Previous studies and designs are being refined. Technology topology is being progressed. Consenting ITT for a Marine consultant is underway and seabed surveys are planned to start in 2019, subject to tendering and availability of suitable vessels. Detailed Engineering Still to be commenced - Subject to Network Options Assessment (NOA) Process Tendering Still to be commenced - Subject to Network Options Assessment (NOA) Process Construction Still to be commenced - Subject to Network Options Assessment (NOA) Process Commissioning/Close Out Still to be commenced - Subject to Network Options Assessment (NOA) Process Link to related info http://www.spenergynetworks.co.uk/pages/network_reinforcement_and_modernisation.asp

SPT-RI-130	**Strathaven – Smeaton**

OVERVIEW OF WORKS

The overhead line conductor system on the existing 11.6km 400,000 Volt double circuit route from Strathaven to Wishaw (XH route) will be replaced with a conductor system of increased thermal rating.

The overhead line conductor system on the existing 61.8km 400,000 Volt double circuit route from Wishaw to Smeaton (XJ route) will be replaced with a conductor system of increased thermal rating.

The existing XH and XJ overhead line routes are equipped with twin 400mm^2 ACSR (Zebra) conductor operating at 50^{o}C. The replacement conductor system is subject to ongoing consideration.

These works will not modify the prevailing circuit configuration.

Programme	Completion:- April 2024
Progress	Design Due to changes in contracted background, design review is required. Design review to be arranged. Consenting Still to be commenced Detailed Engineering Still to be commenced Tendering Still to be commenced Construction Still to be commenced Commissioning/Close Out Still to be commenced Link to related info https://www.spenergynetworks.co.uk/pages/network_reinforcement_and_modernisation.aspx

SPT-RI-131	**Branxton – Eccles**

OVERVIEW OF WORKS

The overhead line conductor system on the existing 34.3km 400,000 Volt double circuit route from Eccles to the Branxton sealing end compound (ZT route) will be uprated to achieve an increased thermal rating.

The existing ZT overhead line route is equipped with twin 700mm^2 AAAC (Araucaria) conductor operating at 75^{o}C. The maximum operating temperature of the conductor system will be increased from 75^{o}C to 90^{o}C.

These works will not modify the prevailing circuit configuration.

Programme	Completion:- April 2024
Progress	Design Still to be commenced Consenting Still to be commenced Detailed Engineering Still to be commenced Tendering Still to be commenced Construction Still to be commenced Commissioning/Close Out Still to be commenced Link to related info https://www.spenergynetworks.co.uk/pages/network_reinforcement_and_modernisation.aspx

SPT-RI-137	Torness/Innerwick/Dunbar 132kV Reinforcement

OVERVIEW OF WORKS

It is proposed to reinforce the Torness/Innerwick/Dunbar No.1 and No.2 132kV circuits, consisting of tower lines and underground cables, to provide a minimum pre-fault summer rating of 108MVA per circuit. For the overhead line section, the transmission works required involve a re-profile of the existing Lynx ACSR conductor system from 50°C to operate at 65°C. The works will also involve installation of a Load Management Scheme to monitor the 132kV No.1 and No.2 circuits (capacity limited by the underground cable) post completion of the new transformers installation at Dunbar GSP in order to send a trip signal to SPD's appropriate generation in an event of an overload.

Programme	Completion:- October 2021
Progress	Design Surveys and pre-engineering studies completed. Consenting Title search completed and consenting against planned route. Land consents forecast completion Q3 2019. Land to be purchased at Innerwick S/S Detailed Engineering Underway on preferred cable routes. Tendering Still to be commenced, Construction Still to be commenced, anticipated start date Q2 2020 Commissioning/Close Out Still to be commenced, completion date under review Link to related info http://www.spenergynetworks.co.uk/pages/network_reinforcement_and_modernisation.asp

SPT-RI-143	Kilmarnock South Substation Reinforcement
OVERVIEW OF WORKS Contracted renewable generation in South West Scotland has reached a level where the thermal uprating of Kilmarnock South 275kV substation is required to ensure compliance with NETS SQSS. The existing switchgear in Kilmarnock South 275kV substation is rated at 2000Amps/952MVA and this will need to be replaced with higher rated switchgear to ensure thermal limits are not exceeded at the 275kV substation. It is proposed to replace the switchgear with 3150Amp/1500MVA rated equipment to provide sufficient capacity for the generation in South West Scotland. Furthermore there are two 400/275kV 1000MVA auto wind transformers at the 400kV substation and to comply with NETS SQSS a third transformer is required to ensure that for N-1 conditions there are no restriction on generation in South West Scotland.	
Programme	Completion:- November 2019
Progress	Design Complete Consenting Complete Detailed Engineering Complete. Tendering All main contracts now placed Construction The building for the new 275kV and 400kV Gas Insulated Switchgear (GIS) are complete and the 400kV GIS is now in service. The 275 GIS has been installed and tested and due to be commissioned Q2 2019. Cabling work is well advanced awaiting final outages for circuit transfers. Commissioning/Close Out Still to be commenced, completion date November 2019. Link to related info https://www.spenergynetworks.co.uk/pages/kilmarnock_south_substation.aspx

SPT-RI-144	Coalburn SGT3
OVERVIEW OF WORKS At Coalburn 400/132kV substation a 360MVA 400/132kV transformer (SGT3) will be installed. In addition, a bus section/coupler circuit breaker arrangement will be installed on the Coalburn 400kV Main busbar, and Coalburn 132kV Reserve busbar, in order to provide three separate 400kV and 132kV busbar sections to which the supergrid transformers may connect. Installation of SGT3 will increase the firm transformer capacity between the Coalburn 400kV and 132kV busbars to 480MVA, to provide additional thermal capacity for renewable generation contracted to connect to the Coalburn 132kV network.	
Programme	Completion:- August 2019
Progress	Design Complete Consenting - No consents required Detailed Engineering Complete Tendering All main contracts now awarded Construction Works commenced 28th May 2018 Civils works complete – BoP works ongoing in line with construction stages. SGT3 Transformer delivered to site 07th March 2019. Cold commisioning will complete 17th June. Commissioning/Close Out Initial staged commissioning underway. Link to related info http://www.spenergynetworks.co.uk/pages/substation_modernisation_and_reinforcement.asp

SPT-RI-146	Maybole to Coylton 132kV Overhead Line Uprating

OVERVIEW OF WORKS

Contracted renewable generation at Maybole GSP has reached a level where the thermal uprating of the 132kV circuit between Maybole and Coylton is required to facilitate this generation.

The two 132kV circuits between Maybole and Coylton are on a mixture of double circuit tower lines, single circuit tower lines, single circuit wood pole overhead lines and also incorporates three 132kV underground cable sections (~1km total). The total route length is 22.5km and consists of CD Route (13km double circuit), CG Route (5km single circuit), N Route (5km single circuit) and X Route (4.5km double circuit).

The existing overhead line circuits are single 175mm ACSR with a pre-fault summer rating of 89MVA.

To accommodate the generation at Maybole GSP it is proposed that the existing Maybole to Coylton 132kV overhead line circuits are reconductored using LARK HTLS conductor. This gives a summer pre-fault continuous rating of 227MVA. In addition, the three 132kV underground cable sections on the circuit (~1.2km in total), will be replaced with 1600mm^2 Al XLPE cable to match the new rating of the overhead line.

Programme	Completion:- August 2022
Progress	Design Early engineering design phase Consenting Still to be commenced Detailed Engineering Still to be commenced Tendering Still to be commenced Construction Still to be commenced, anticipated start date Q2 2020 Commissioning/Close Out Still to be commenced, completion date August 2022 Link to related info http://www.spenergynetworks.co.uk/pages/network_reinforcement_and_modernisation.asp

SPT-RI-151	Galashiels to Eccles 132kV Overhead Line Rebuilding

OVERVIEW OF WORKS

The existing two 132kV circuits between Galashiels and Eccles are on a mixture of double circuit tower lines single circuit tower lines and two 132kV underground cable sections (for the overhead line termination at each end). (The circuits are made up of part of P Route and AT Route U Route overhead lines). The Galashiels to Eccles No.1 and No.2 132kv overhead lines are single 175mm^2 ACSR, with a pre-fault summer rating of 89MVA, each with a total circuit length of 30.58km and 30.14km respectively.

In order to provide GBSQSS compliant connections for additional generation requiring to export from Galashiels to Eccles, it is proposed to construct a new 132kV double circuit tower line between Galashiels and Eccles, and remove the existing U and AT Routes. The new double circuit will provide the following minimum circuit ratings:

	Winter		Autumn		Summer	
	Amps	MVA	Amps	MVA	Amps	MVA
Pre-Fault Continuous	615	140	590	134	540	124
Post-Fault Continuous	730	167	700	160	645	147

Programme	Completion:- July 2023
Progress	Design Early engineering design phase. Surveys of current OHL to be undertaken. Consenting Early environmental works progressing Detailed Engineering - Still to be commenced Tendering - Environmental consultancy tender in progress Construction - Still to be commenced, anticipated start date Q2 2021 Commissioning/Close Out - Still to be commenced, completion date October 2023 Link to related info http://www.spenergynetworks.co.uk/pages/network_reinforcement_and_modernisation.asp

SPT-RI-155	Coalburn –Linnmill No.1 132kV Underground Cable Reinforcement

OVERVIEW OF WORKS

There are two 132kV circuits from Coalburn 132kV substation which supply Linnmill 132/33kV Grid Supply Point (GSP). From Coalburn. Each Linnmill 132kV circuit has an initial 3.2km 300mm Cu underground cable section (rated at 123MVA summer continuous and 141MVA cyclic). These connect to a 132kV tower line with each circuit having a 302MVA summer pre- fault continuous rating (ex 275kV circuit).

Contracted renewable generation at Linnmill GSP has reached a level where the thermal uprating of the 132kV underground cable section, on the Coalburn to Linnmill GSP No.1 132kV circuit, is required to ensure compliance with the NETS SQSS. (Blacklaw Extension wind farm (69MW) is contracted to connect to the Coalburn to Linnmill No.1 circuit, resulting in this circuit's thermal limit being reached before the No.2 circuit).

It is proposed to replace the 3.2km 132kV underground cable section, on the Coalburn to Linnmill No.1 132kV circuit, with a 2000mm Cu XLPE cable having a continuous summer rating of 1285A (293MVA).

Programme	Completion:- October 2020
Progress	Design Initial engineering design phase complete, now progressing through detailed engineering. Consenting Detailed discussions with landowners progressing and we have agreement for voluntary wayleaves with two of the landowners. We have now commenced the statutory process with the third land owner. Current programme includes requirement for this leading to October 2020 completion date. Detailed Engineering Progressing detailed engineering following completion of the initial engineering design phase. Tendering Tendering for cable works commenced in March 2019 and is running in parallel with consenting. Construction Still to be commenced, anticipated start date Q4 2019 due to the above consenting issues. Commissioning/Close Out Completion date October 2020.

	Link to related info http://www.spenergynetworks.co.uk/pages/network_reinforcement_and_modernisation.asp

SPT-RI-158	New Cumnock 132kV Substation Extension

OVERVIEW OF WORKS

Contracted renewable generation in South West Scotland has reached a level where the thermal rating of the New Cumnock 275kV substation supergrid 275/132kV transformers, which currently planned to connect to 132kV Board A, is exceeded. There is also a fault level issue triggered by the current contracted generation on the New Cumnock 132kV Board A. In order to mitigate these issues, it is proposed to separate Board A into Boards A and C whereas Board B remains. Cabling and transformer connections for Boards A and B will also be reconfigured as follows:

- Board A: 3 × 275/132kV SGT1A, SGT2A and SGT3A 240MVA auto wind transformers, providing a total firm capacity of 720MVA
- Board B: 3 × 275/132kV SGT1B, SGT2B and SGT3B 240MVA auto wind transformers, providing a total firm capacity of 720MVA
- Board C: 2 × 275/132kV SGT1C and SGT3C 360MVA auto wind transformers, providing a total firm capacity of 720MVA

This will provide sufficient transformer capacity for the current overall contracted generation into New Cumnock (the contracted generation position in South West Scotland as indicated in December 2017).

Programme	Completion: October 2022
Progress	Design Early engineering design phase in progress with surveys, tender pack now ready for peat survey which will allow design to progress. Consenting Still to be commenced – Q3 – 2019. Planning application (local) submission October 2019 with expected determination January 2020. Detailed Engineering Still to be commenced, will be started following peat survey results. Geophysical peat survey undertaken May 2019 to inform peat solution for platform construction. Earthing study June 2019. Tendering Still to be commenced. Bulk order process commenced for procurement of SGTs – award date Jan 2020.

	Construction Still to be commenced. Commissioning/Close Out Still to be commenced Link to related info http://www.spenergynetworks.co.uk/pages/substation_modernisation_and_reinforcement.asp

SPT-RI-162	Coylton 275kV Infrequent Infeed Loss Risk Protection Scheme

OVERVIEW OF WORKS

A protection scheme will be installed at Coylton 275kV substation, on the Ayr/Kilmarnock South No.1 and No.2 275kV circuits (XY Route), such that if a level of power flow from Coylton to Kilmarnock South is detected which may result in the Infrequent Infeed Loss Risk (as defined in the NETS Security and Quality of Supply Standard) being exceeded, a trip signal will be provided to SP Transmission and/or SP Distribution to disconnect generation as required such that the Infrequent Infeed Loss Risk is not exceeded.

Programme	Completion:- Progressing towards completion
Progress	Design Initial engineering design complete Consenting No consents required Detailed Engineering Detailed engineering complete Tendering Cabinet tender complete E&C contract placed Q1 2016. Construction Progressing towards completion. Commissioning/Close Out Progressing towards completion. Still to be commenced, completion date 31st October 2019. Link to related info http://www.spenergynetworks.co.uk/pages/substation_modernisation_and_reinforcement.asp

SPT-RI-170	Tongland 132-33kV GSP Reinforcement

OVERVIEW OF WORKS

At present, Tongland Grid Supply Point is supplied by two 132/11kV grid transformers which feed two 11kV boards, Tongland Hydro generation, Tongland 11kV Distribution and two outgoing feeders. Each of the two outgoing feeders is connected to two step-up 11/33kV 10MVA transformers, with 40MVA capacity in total supplying the 33/11kV primary substations (Castle Douglas, Dalbeatie and Gatehouse). The 30MVA 132/11kV transformers have reached the thermal capacity limit and the GSP is required to be reinforced.

It is proposed to commission a new 33kV GSP at Tongland substation to provide a system that is consistent with standard design and provides sufficient capacity and flexibility for the future.

Programme	Completion:- September 2020
Progress	Design In Progress Consenting Planning consent approved. SEPA CAR license applied for Detailed Engineering Complete Tendering Civil contract awarded Q1 2016 BOP contract awarded Q1 2017 Construction Commenced date March 2016 Commissioning/Close Out Phased commissioning between Q3 2016 and Q1 2020 Link to related info http://www.spenergynetworks.co.uk/pages/substation_modernisation_and_reinforcement.asp

SPT-RI-173	Glenglass Extension and Glenmuckloch Collector

OVERVIEW OF WORKS

To enable the connection of Glenmuckloch Pump Storage into Glenglass substation and ensure system compliance with NETS SQSS between Glenglass and the pump storage site the 132kV network need to be extended from Glenglass to the pump storage site. To achieve this the following elements need to be established:

1. A double busbar 132kV Gas Insulated Substation (GIS) at Glenglass
2. Reconfiguration of Glenglass substation to bus all 132kV circuits into the 132kV substation
3. A double busbar 132kV Air Insulated Substation (AIS) substation at Glenmuckloch pump storage site
4. Steel lattice double circuit 132kV overhead line joining Glenglass and Glenmuckloch substations
5. Uprating of the cables on the Blackhill-Glenglass 132kV circuits at Blackhill

Programme	Completion:- October 2023
Progress	Design Early Engineering design phase progressing. Consenting Public Consultation on overhead line route in progress. Detailed Engineering Still to be commenced Tendering Still to be commenced Construction Still to be commenced Commissioning/Close Out Still to be commenced Link to related info http://www.spenergynetworks.co.uk/pages/substation_modernisation_and_reinforcement.asp

SPT-RI-176	New Cumnock Overload Protection Scheme

OVERVIEW OF WORKS

To utilise the non-firm capacity at New Cumnock and the 132kV network in South West Scotland an overload protection scheme is required at New Cumnock substation to monitor the loading on the 275kV circuits from Coylton, supergrid transformers and 132kV circuits at New Cumnock to prevent any overloading on the transmission system. The scheme at New Cumnock will communicate with remote systems at Dunhill, Blackhill, Glenglass and Kendoon North substations to trigger tripping signals to generators connected at these substations.

Programme	Completion:- October 2021
Progress	Design Early engineering design phase. Consenting No consents required Detailed Engineering Still to be commenced Tendering Still to be commenced. Construction Still to be commenced. Commissioning/Close Out Still to be commenced. Link to related info http://www.spenergynetworks.co.uk/pages/substation_modernisation_and_reinforcement.asp

SPT-RI-177	Glenglass Overload Protection Scheme

OVERVIEW OF WORKS

To utilise the non-firm capacity at New Cumnock, Glenglass and the 132kV network in South West Scotland an overload protection scheme is required at Glenglass substation to monitor loading at Glenglass and receive intertrip signals from New Cumnock to prevent any overloading on the transmission system. On the receipt of a local overload signal or a remote intertrip signal from New Cumnock, the scheme will trip generators in a pre-determined sequence by opening the relevant circuit breaker.

Stage 1

The transformer overload protection will be required first with currently a proposed delivery date of April 2020 to align with the Twentyshilling wind farm connection.

Stage 2

The 132kV OHL overload protection will be delivered in May 2021, currently aligned with the connection of Sandy Knowe wind farm.

Programme	Stage 1: 30th April 2020 Stage 2: 31st May 2021
Progress	Design Early engineering design phase complete Consenting No consents required Detailed Engineering Still to be commenced Tendering Still to be commenced. Construction Still to be commenced. Commissioning/Close Out Still to be commenced. Link to related info http://www.spenergynetworks.co.uk/pages/substation_modernisation_and_reinforcement.asp

SPT-RI-185	Galashiels 132kV/Dunlaw Extension 132kV Overload Protection Scheme

OVERVIEW OF WORKS

Installation of an Energy Management (Overload Protection) Scheme at Galashiels 132kV substation and Dunlaw Extension substation to monitor the following circuits:

1) Galashiels to Eccles No.1 132kV Circuit
2) Galashiels to Eccles No.2 132kV Circuit
3) Dunlaw Extension to Smeaton 132kV Circuit

If the seasonal post-fault rating of these circuits is exceeded a trip signal will be issued to SPT at Dunlaw Extension 33kV substation to disconnect the appropriate generation to remove the overload.

Programme	Completion:- June 2021
Progress	Design Initial engineering commenced. Consenting Still to be commenced. Detailed Engineering Still to be commenced. Tendering Still to be commenced. Construction Still to be commenced. Commissioning/Close Out Still to be commenced, completion date June2021 Link to related info http://www.spenergynetworks.co.uk/pages/substation_modernisation_and_reinforcement.asp

SPT-RI-186	**Kilmarnock South Supergrid T1(2)(6) Overload Protection Scheme**
To maintain security of supplies and prevent unacceptable overloading on the transmission system a load management scheme (LMS) is required at Kilmarnock South. The aim of the LMS is to ensure for the planned or unplanned unavailability of two out of the three 400/275kV 1000MVA supergrid transformers at Kilmarnock South the remaining transformer is not overloaded.	
Programme	Completion:- October 2020
Progress	Design Early engineering design phase Consenting No consents required Detailed Engineering Still to be commenced Tendering Still to be commenced. Construction Still to be commenced. Commissioning/Close Out Still to be commenced. Link to related info http://www.spenergynetworks.co.uk/pages/substation_modernisation_and_reinforcement.asp

SPT-RI-191	Gretna-Ewe Hill 132kV Reinforcement

OVERVIEW OF WORKS

The thermal capacity of the 132kV circuit between Gretna 132kV substation and Ewe Hill Wind Farm 132kV Collector Substation (works detailed in SPT-RI-017), will be increased by re-conductoring the 132kV overhead line utilising "Lark" High Temperature Low Sag (HTLS) conductor (~16km), and installing an additional 800mm2 Al XLPE 132kV underground cable in parallel with the existing cable (~0.3km), to give a minimum summer continuous rating of 224MVA. This is to accommodate additional generation connecting at the Ewe Hill Wind Farm 132kV Collector Substation.

Programme	Completion:- October 2022
Progress	Design Early design in progress. Consenting All required servitudes have been concluded. Detailed Engineering Still to be commenced Tendering Still to be commenced for construction works. Contract for Lark conductor supply and type testing has been placed. Construction Still to be commenced Commissioning/Close Out Completion date October 2022. Link to related info https://www.spenergynetworks.co.uk/pages/network_reinforcement_and_modernisation.aspx

SPT-RI-196	Clyde South 33kV Works and Overload Protection Scheme

OVERVIEW OF WORKS

At Clyde South substation, the following will be installed: A containerised substation
Transformer 33kV incomer circuit breaker (to form a part of a 3 panel board with a 33kV feeder circuit breaker for Whitelaw Brae 'A' Wind Farm and a 33kV feeder circuit breaker for Crookedstane Wind Farm, both of which will be contained within the relevant wind farm TOCOs)
0.05km 2x500mm2 Cu XPLE cable from the LV side of SGT1A to the new incomer circuit breaker
At Clyde South 275/33kV substation, an overload protection scheme will be installed on the Clyde

SGT1A and SGT1B transformers.

Programme	Completion:- April 2021
Progress	Design Early design in progress Earthing study, drainage survey and GPR survey complete Ecological survey on cable route commenced in April '19 and is due to be completed in July '19. Consenting Negotiation of land rights continues. Detailed Engineering Still to be commenced Tendering Still to be commenced Construction Still to be commenced Commissioning/Close Out Still to be commenced Link to related info http://www.spenergynetworks.co.uk/pages/substation_modernisation_and_reinforcement.asp

SPT-RI-198	Newton Stewart 132kV Substation Works
OVERVIEW OF WORKS At Newton Stewart 132/33kV substation, a second 132/33kV transformer will be installed as part of a separate project in order to accommodate contracted generation on a firm basis. To enable the transformer installation, substation works are required involving a new 132kV line isolator to connect the second grid transformer onto the existing T2 33kV circuit breaker.	
Programme	Completion:- October 2023
Progress	Design Early design in progress. Consenting Still to be commenced . Detailed Engineering Still to be commenced. Tendering Still to be commenced. Construction Still to be commenced. Commissioning/Close Out. Still to be commenced. Link to related info http://www.spenergynetworks.co.uk/pages/substation_modernisation_and_reinforcement.asp

SPT-RI-200	East Coast Phase 2 Reinforcement

OVERVIEW OF WORKS

SP Transmission works associated with SHE Transmission East Coast Phase 2 400kV Reinforcement (reference SHET-RI-093), comprising:

- Uprating of the existing Kincardine-Tealing/ Kintore (XL)[1] overhead line route from 275kV 50°C operation to 400kV 65°C operation between Kincardine and the SP Transmission/ SHE Transmission border; and

- Installation of 2 x 400/275kV 1100MVA auto-transformers at Kincardine.

Note the existing Kincardine-Tealing 275kV and Kincardine-Kintore 275kV circuits may be terminated in a new SHE Transmission substation at Alyth in advance of the works described in this TORI. In this event, reference to Kincardine-Tealing/ Kintore will become Kincardine-Alyth.

Programme	Completion:- TBC subject to Network Options Assessment (NOA) Process and potential Ofgem Strategic Wider Work (SWW)
Progress	Design Conceptual design has been kicked-off following NOA4 results published Consenting Still to be commenced - Subject to Network Options Assessment (NOA) Process Detailed Engineering Still to be commenced - Subject to Network Options Assessment (NOA) Process Tendering Still to be commenced - Subject to Network Options Assessment (NOA) Process Construction Still to be commenced - Subject to Network Options Assessment (NOA) Process Commissioning/Close Out Still to be commenced - Subject to Network Options Assessment

	(NOA) Process Link to related info https://www.spenergynetworks.co.uk/pages/east_coast_400kv_reinforcement_project.aspx

SPT-RI-204	Wishaw-Smeaton-Torness-Eccles Overload Protection Scheme
OVERVIEW OF WORKS An overload protection scheme is proposed to be installed within the Wishaw – Smeaton – Torness – Eccles 400kV network in order to protect the system as part of a Category 2 Intertripping Scheme as defined by the Grid Code.	
Programme	Completion: Programme under review
Progress	Design Design for tender Complete. Consenting Not required Detailed Engineering Still to be commenced by successful tenderer Tendering PQQ exercise complete, tenderers selected. Tendering commenced, ITT issued. Contract Award expected Q4 2019 Construction Still to be commenced Commissioning/Close Out Still to be commenced Link to related info https://www.spenergynetworks.co.uk/pages/substation_modernisation_and_reinforcement.aspx

SPT-RI-205	Mark Hill to Chirmorie/Stranoch Wind Farm 132kV Circuit

OVERVIEW OF WORKS

At Mark Hill 132kV substation a 132kV switch bay will be installed. From this a 132kV circuit, consisting of 0.5 km of underground cable and 13.5km of 132kV overhead line (300mm UPAS conductor), will be installed to the overhead line tee point connecting the circuits to Chirmorie and Stranoch wind farms. The 300mm UPAS conductor has the following circuit ratings:

	Winter		Autumn		Summer	
	Amps	MVA	Amps	MVA	Amps	MVA
Pre-Fault Continuous	885	203	845	193	770	176
Post-Fault Continuous	1060	241	1000	230	915	210

The underground cable will be sized to match the ratings of the overhead line.

Programme	Completion:- September 2022
Progress	Design Early design in progress Consenting Consultation on the preferred route underway Detailed Engineering Still to be commenced Tendering Still to be commenced Construction Still to be commenced Commissioning/Close Out Still to be commenced Link to related info https://www.spenergynetworks.co.uk/pages/stranoch_windfarm.aspx https://www.spenergynetworks.co.uk/pages/chirmorie_windfarm_connection_project.aspx

SPT-RI-206	Mark Hill SGT3 240MVA
OVERVIEW OF WORKS At Mark Hill substation a 275kV switchbay will be installed to control a 275/132kV 240MVA transformer (SGT3). This will connect to a 132kV busbar (B Board) provided for the connection of renewable generation.	
Programme	Completion:- September 2022
Progress	Design Early design in progress Consenting Consenting activities in progress. Public consultation in progress. Detailed Engineering Still to be commenced Tendering Still to be commenced Construction Still to be commenced Commissioning/Close Out Still to be commenced Link to related info https://www.spenergynetworks.co.uk/pages/substation_modernisation_and_reinforcement.aspx

SPT-RI-207	Currie 275kV Reinforcement Works
OVERVIEW OF WORKS At Currie 275kV Substation: Removal of all five 275kV bulk oil circuit breakers and installation of five new 275kV SF6 AIS circuit breakers. Installation of a new 275/132kV 240MVA Super Grid Transformer. All associated protection and control works. All associated environmental and civil works. Miscellaneous works.	
Programme	Completion:- October 2020
Progress	Design Complete Consenting Complete Detailed Engineering Complete Tendering Complete Construction The project is progressing to programme with 275kV breaker replacement being carried out in a phased manner on a planned basis between March 2018 and October 2020 Commissioning/Close Out Still to be commenced expected October 2020 Link to related info https://www.spenergynetworks.co.uk/pages/substation_modernisation_and_reinforcement.aspx

SPT-RI-211	Longburn to Kendoon North 132kV Circuit
OVERVIEW OF WORKS Construction of a new 132kV circuit between Kendoon North 132kV substation and the junction between Lorg Wind Farm and Longburn Wind Farm Collector Substation. From the junction of the circuits from Lorg Wind Farm and Longburn Wind Farm Collector Substation, install ~10km of 132kV overhead line (UPAS 300mm2) to Kendoon North 132kV substation. At Kendoon North substation, install one double busbar 132kV bay.	
Programme	Completion:- April 2023
Progress	Design Early design in progress. OHL route has been confirmed. Consenting Consultation on the preferred route took place recently and responses are being reviewed in order to confirm the route to be taken forward. Detailed Engineering Commenced Tendering Still to be commenced Construction Still to be commenced Commissioning/Close Out Still to be commenced Link to related info https://www.spenergynetworks.co.uk/pages/lorg_longburn_wind_farms.aspx

SPT-RI-213	**New Cumnock 275/132kV Transformer SGT2B**
OVERVIEW OF WORKS At New Cumnock substation a third 275/132 240MVA transformer will be installed to increase the capacity of the 132kV Board B.	
Programme	Completion:-September 2022
Progress	Design Early design in progress Consenting Not Applicable Detailed Engineering Still to be commenced Tendering Still to be commenced. Bulk order process commenced for procurement of SGTs – award date Jan 2020. Construction Still to be commenced Commissioning/Close Out Still to be commenced Link to related info https://www.spenergynetworks.co.uk/pages/substation_modernisation_and_reinforcement.aspx

SPT-RI-214	**ZS Route Overhead Line Uprating Works (Smeaton – Fallago)**
OVERVIEW OF WORKS The overhead line conductor system on the existing 31.1km 400,000 Volt circuit from Smeaton to Fallago (ZS route) will be uprated to achieve an increased thermal rating. The existing ZS overhead line route is equipped with twin 700mm2 AAAC (Araucaria) conductor operating at 75oC. The maximum operating temperature of the conductor system will be increased from 75oC to 85oC. These works will not modify the prevailing circuit configuration.	
Programme	Completion:- April 2024
Progress	Design Early design in progress Consenting Not Applicable Detailed Engineering Still to be commenced Tendering Still to be commenced Construction Still to be commenced Commissioning/Close Out Still to be commenced Link to related info http://www.spenergynetworks.co.uk/pages/network_reinforcement_and_modernisation.asp

SPT-RI-215	**Wishaw 400kV GIS Substation Reconfiguration**
OVERVIEW OF WORKS Terminate the existing Strathaven-Torness 400kV circuit in Wishaw 400kV Substation and install a 400kV bus section circuit breaker at Wishaw 400kV Substation.	
Programme	Completion:- April 2024
Progress	Design Early design in progress Consenting Not Applicable Detailed Engineering Still to be commenced Tendering Still to be commenced Construction Still to be commenced Commissioning/Close Out Still to be commenced Link to related info https://www.spenergynetworks.co.uk/pages/substation_modernisation_and_reinforcement.aspx

SPT-RI-216	**Dunbar 132kV Line Isolators**
OVERVIEW OF WORKS Establishment and installation of two 132kV line isolators at Dunbar GSP. All associated civil, miscellaneous and minor works.	
Programme	Completion:- October 2021
Progress	Design Engineering detailed design in progress Consenting Review of consents requirements underway. Detailed Engineering Underway Tendering Civil and BoP tenders progressing Construction Still to be commenced – Anticipated start now Q3 2019 Commissioning/Close Out Still to be commenced Link to related info http://www.spenergynetworks.co.uk/pages/network_reinforcement_and_modernisation.asp

SPT-RI-218	**Coalburn 132kV Bus Coupler Auto-Close Scheme**
OVERVIEW OF WORKS An auto-close scheme will be installed, at Coalburn 132kV substation, on the 132kV bus-coupler Circuit Breaker (CB) which couples the Main 1 and Reserve 132kV busbars (CB 1030). Following installation of the auto-close scheme, the bus coupler CB 1030 will be normally open to split the 132kV busbars into two discrete sections (Main 1 and Main2/Reserve), supplied by different supergrid transformers. This will maintain the 132kV fault level within design limits on each section of 132kV busbar, and allow additional generation to connect.	
Programme	Completion:- June 2020
Progress	Design Early design in progress Consenting Not Applicable Detailed Engineering Still to be commenced Tendering Still to be commenced Construction Still to be commenced Commissioning/Close Out Still to be commenced Link to related info https://www.spenergynetworks.co.uk/pages/substation_modernisation_and_reinforcement.aspx

SPT-RI-220	**CM Route Uprating**
OVERVIEW OF WORKS New generation at SHETL's Dunoon 132kV substation necessitates an uprating of the 132kV shared circuit between Dunoon and the tee into the Sloy-Windyhill circuit. SPT's portion of the circuit runs between tower CM01 and mid span between CM13/14. The circuit presently uses 125mm2 ACSR Tiger conductor. It is proposed that SPT uprate the double circuit to Poplar 200mm2 conductor from CM1 to CM12. It is assumed SHETL will uprate over the boundary span between CM14 and CM13, terminating at tower CM12.	
Programme	Completion:-– 31st July 2023
Progress	Design Early Engineering works in progress. Consenting Consenting requirements under review. Detailed Engineering Still to be commenced Tendering Still to be commenced Construction Still to be commenced Commissioning/Close Out Still to be commenced Link to related info http://www.spenergynetworks.co.uk/pages/network_reinforcement_and_modernisation.asp

SPT-RI-221	Kendoon to Glenlee 132kV reinforcements

OVERVIEW OF WORKS

The works in this reinforcement entails the extension of the L7 high capacity (twin UPAS) 132kV double circuit that runs between New Cumnock substation and the Margree Tee off in South West Scotland to Glenlee substation. This will enable the increase of transfer capability from the Galloway group to the wider supergrid system at New Cumnock. The transfer capability of the group is currently limited by the single 132kV Lynx circuit between Kendoon and Tongland. At Glenlee the substation will need to be extended to modify the configuration of the substation from a four to a six mesh corner arrangement to allow the termination of the new high capacity double circuit overhead line from New Cumnock. One side of the circuit will also be turned into Kendoon to maintain connectivity at the substation.

Programme	Completion:- October 2023
Progress	Design Tender design in ongoing. Consenting OHL Section 37 application and Glenlee Planning Consent Application anticipated in Q3 2019 Detailed Engineering Underway Tendering To be commenced in Q2 2019. Construction Still to be commenced Commissioning/Close Out Still to be commenced Link to related info https://www.spenergynetworks.co.uk/pages/dumfries_galloway_strategic_reinforcement.aspx

SPT-RI-222	**Glenlee to Tongland 132kV Modernisation**
OVERVIEW OF WORKS The works in this modernisation entails the construction of a new L4 (single POPLAR) 132kV double circuit from Glenlee to Tongland. This will enable the increase of transfer capability from Tongland to the wider supergrid system at New Cumnock and increase the local boundary capabilities of the 132kV system. The transfer capability of Tongland is currently limited by the single 132kV Lynx circuit between Glenlee and Dumfries and this scheme will remove this limitation.	
Programme	Completion:- October 2023
Progress	Design Tender design in progress Consenting Section 37 application anticipated in Q3 2019 Detailed Engineering Underway. Tendering Still to be commenced Construction Still to be commenced Commissioning/Close Out Still to be commenced Link to related info https://www.spenergynetworks.co.uk/pages/dumfries_galloway_strategic_reinforcement.aspx

SPT-RI-223	**Glenlee to Newton Stewart Reconductoring**
OVERVIEW OF WORKS The existing No.1 and No.2 132kV circuits between Glenlee and Newton Stewart substations are on a double circuit tower line (~ 30km, BG route). The overhead line circuits are single 175mm^2 ACSR with a pre-fault summer rating of 89MVA. To facilitate increasing levels of generation at Glenluce and Newton Stewart GSP, it is proposed to reconductor BG route with High Temperature Low Sag conductor (HTLS) to provide a minimum summer pre-fault continuous rating of 250MVA.	
Programme	Completion:- October 2023
Progress	Design Early design in progress Consenting Not Applicable Detailed Engineering Still to be commenced Tendering Still to be commenced Construction Still to be commenced Commissioning/Close Out Still to be commenced Link to related info https://www.spenergynetworks.co.uk/pages/dumfries_galloway_strategic_reinforcement.aspx

SPT-RI-224	**Coylton SGT1(2) Reinforcement**
OVERVIEW OF WORKS At Coylton substation, the existing SGT1 and SGT2 275/132kV 120MVA Auto-transformers will be replaced (on line) with 240MVA units.	
Programme	Completion:- August 2022
Progress	Design Early design in progress Consenting Not Applicable Detailed Engineering Still to be commenced Tendering Early preparation for transformers tender process in progress. Construction Still to be commenced Commissioning/Close Out Still to be commenced Link to related info https://www.spenergynetworks.co.uk/pages/substation_modernisation_and_reinforcement.aspx

SPT-RI-226	**275/132kV Elvanfoot Transformer**
OVERVIEW OF WORKS A new 275/132kV 360MVA transformer shall be installed at Elvanfoot substation. This will create a new 132kV busbar at Elvanfoot, to allow new generators to connect.	
Programme	Completion:- October 2022
Progress	Design Early design in progress Consenting Not Applicable Detailed Engineering Still to be commenced Tendering Still to be commenced Construction Still to be commenced Commissioning/Close Out Still to be commenced Link to related info https://www.spenergynetworks.co.uk/pages/substation_modernisation_and_reinforcement.aspx

SPT-RI-227	**Chapelcross – Harker 132kV Uprating**
OVERVIEW OF WORKS It is proposed to rebuild AK and T Route single circuit Chapelcross to Harker 132kV overhead line, in order to increase the thermal rating to a minimum summer pre-fault continuous rating of 227MVA. The current circuit is a 132kV overhead tower line, with Lynx conductor, with a pre-fault summer continuous rating of 89MVA. This project is in response to the increased level of generation in the area. The 132kV overhead line circuit between Chapelcross and Harker has split ownership, 17.5 km from Chapelcross 132kV substation following AK and T route, to tower T137A. This is owned by SPT with the remaining 8.6 km from tower T137A to Harker 132kV substation owned by NGET. Any uprating by SPT will need to be matched by NGET. The project will be to rebuild the SPT-owned 17.5km of AK and T route utilising LARK HTLS conductor on a 132kV wood pole construction. This will provide a pre-fault summer continuous rating of 227MVA. The existing Ak and T route 132kV steel tower circuit will be dismantled.	
Programme	Completion:- November 2024
Progress	Design Early design in progress Consenting Env / Planning consultant contract awarded working to identify route corridors Detailed Engineering Still to be commenced Tendering Still to be commenced Construction Still to be commenced Commissioning/Close Out Still to be commenced Link to related info https://www.spenergynetworks.co.uk/pages/substation_modernisation_and_reinforcement.aspx

SPT-RI-229	**Moffat SGT3**
OVERVIEW OF WORKS A new 400/132kV 240MVA transformer, and associated 400kV and 132kV circuit breaker bays, shall be installed at Moffat 400/132kV substation to increase the available generation capacity at the 132kV substation.	
Programme	Completion:- December 2023
Progress	Design Early design in progress Consenting Not Applicable Detailed Engineering Still to be commenced Tendering Still to be commenced Construction Still to be commenced Commissioning/Close Out Still to be commenced Link to related info https://www.spenergynetworks.co.uk/pages/substation_modernisation_and_reinforcement.aspx

SPT-RI-230	**Gretna to Faw Side WF Tee 132kV Reinforcement**
OVERVIEW OF WORKS It is proposed to reconductor approximately 36km of the 132kV overhead line existing Gretna to Hawick circuit (AL and V Route), between Gretna and the proposed Faw Side Community Wind Farm 'T' connection. It is proposed to utilise LARK HTLS conductor. NGET own a section of AL and V Route on this circuit and will have to reinforce to match the SPT proposals.	
Programme	Completion:- November 2024
Progress	Design Early design in progress Consenting Not Applicable Detailed Engineering Still to be commenced Tendering Still to be commenced Construction Still to be commenced Commissioning/Close Out Still to be commenced Link to related info https://www.spenergynetworks.co.uk/pages/substation_modernisation_and_reinforcement.aspx

SPT-RI-231	**Elvanfoot to Harker 400kV Circuit Uprating**
OVERVIEW OF WORKS In order to maintain the 4.4GW North-South boundary transfer over Boundary B6, due to the level of generation connecting on to this interconnector, it is necessary to thermally uprate the Elvanfoot – Harker 400kV double circuit, via reconductoring with twin Curlew HTLS conductor, operating at 190°C.	
Programme	Completion:- December 2023
Progress	Design Design not kicked off yet. Consenting Not Applicable Detailed Engineering Still to be commenced Tendering Still to be commenced Construction Still to be commenced Commissioning/Close Out Still to be commenced Link to related info https://www.spenergynetworks.co.uk/pages/substation_modernisation_and_reinforcement.aspx

SPT-RI-232	**Ewe Hill Substation Transformer 132-33kV**
OVERVIEW OF WORKS A new 132/33kV 90MVA transformer will be installed at Ewe Hill Wind Farm substation. This will create a new 33kV busbar to allow new generators to connect.	
Programme	Completion:- October 2022
Progress	Design Early design in progress Consenting Still to be commenced Detailed Engineering Still to be commenced Tendering Still to be commenced Construction Still to be commenced Commissioning/Close Out Still to be commenced Link to related info https://www.spenergynetworks.co.uk/pages/substation_modernisation_and_reinforcement.aspx

SPT-RI-233	**Gretna to Jun V 132kV Circuit Reinforcement (AL Route)**
OVERVIEW OF WORKS It is proposed to reconductor AL Route single circuit Gretna to Junction V 132kV overhead line, in order to increase the thermal rating to a minimum summer pre-fault continuous rating of 124MVA. The current circuit is a 132kV overhead tower line, with Lynx conductor, with a pre-fault summer continuous rating of 89MVA. This project is in response to the increased level of generation in the area. The 132kV overhead line circuit between Gretna and Junction V has split ownership, 5 km from Gretna 132kV substation following AL route, to tower AL57. This is owned by SPT with the remaining section from tower AL57 to AL68 at Junction V owned by NGET. Any uprating by SPT will need to be matched by NGET. The project will be to reconductor the SPT-owned 5km of AL route utilising Poplar conductor on the existing steel tower construction. This will provide a pre-fault summer continuous rating of 124MVA.	
Programme	Completion:- October 2023
Progress	Design Early design in progress Consenting Still to be commenced Detailed Engineering Still to be commenced Tendering Still to be commenced Construction Still to be commenced Commissioning/Close Out Still to be commenced Link to related info https://www.spenergynetworks.co.uk/pages/substation_modernisation_and_reinforcement.aspx

SPT-RI-234	**Glenniston to Mossmorran No.2 Cct Reinforcement Works**
OVERVIEW OF WORKS The original scope of works has been revised following the system restudy in the area. The revised scope of works is divided into 2 stages as outlined in the followings. The works are required at Glenniston 132kV substation in order to increase the thermal rating of the equipment: Stage 1 • Glenniston 132kV T1 LVDOC Relay, and • Glenniston 132kV T2 LVDOC Relay. Stage 2 • Replace the 132kV disconnectors 124 and 128 and bus section circuit breaker 120 to achieve a minimum rating of 185MVA.	
Programme	Completion: Stage1 June 2020 Stage2 April 2021
Progress	Design Early design in progress Consenting Not Applicable Detailed Engineering Still to be commenced Tendering Still to be commenced Construction Still to be commenced Commissioning/Close Out Still to be commenced Link to related info https://www.spenergynetworks.co.uk/pages/substation_modernisation_and_reinforcement.aspx

SPT-RI-235	Erskine Grid T1 and T2 Reinforcement
OVERVIEW OF WORKS At Erskine GSP the existing GRID T1 and GRID T2 transformers are 30MVA 132/33kV units which have both been identified as being due for replacement during the RIIO-T1 period. It is proposed to replace the two existing 30MVA 132/33kV grid transformers with two 60MVA grid transformers, as well as the associated transformer bay and protection equipment. N.B. An offline build of the new T1 & T2 transformers is planned to minimise outage.	
Programme	August 2019
Progress	In early design and development phase Design; Complete.. Consenting: Complete. Detailed Engineering: Complete. Tendering: Complete. Construction: Works on going. Commissioning/GT2 Completed 17/12/18, GT1 due for completion 30/8/19. Link to related info https://www.spenergynetworks.co.uk/pages/substation_modernisation_and_reinforcement.aspx

SPT-RI-236	**Glenmuckloch to ZV Route Reinforcements**
OVERVIEW OF WORKS The works in this TORI entails the extension of the 132kV network from Glenmuckloch collector substation to a new substation north of Elvanfoot substation on the ZV route. It is proposed to establish a new 400kV substation by turning in the Strathaven to Elvanfoot 400kV circuit. From the new 400kV substation three 400/132kV 240MVA interbusing transformers will connect to a new 132kV substation from which a new 132kV double circuit OHL will be established between the new substation and Glenmuckloch collector substation. The works in this TORI are dependent on the completion of the works in TORI 173.	
Programme	Completion October 2027
Progress	Design Early design in progress. High level routing options being assessed. Consenting Consenting requirements being assessed. Detailed Engineering Still to commence Tendering Still to commence Construction Still to commence Commissioning/Close Out Still to commence Link to related info https://www.spenergynetworks.co.uk/pages/substation_modernisation_and_reinforcement.aspx

SPT-RI-237	**Enoch Hill Collector 132/33 kV substation and associated 132 kV circuit**
OVERVIEW OF WORKS A 132/33kV substation will be established, adjacent to Enoch Hill wind farm, in East Ayrshire (255265E, 609695N). A new circuit by underground cable 4.4 km in length from Board C, will connect this new substation into a new 132kV bay on Board C, at New Cumnock 132kV substation. This TORI describes the works required for the installation of Enoch Hill Collector 132/33 kV Substation and its associated 132 kV circuit The 132 kV circuit is approximately 5km in length and extend from the Enoch Hill collector substation to New Cumnock.	
Programme	May 2023
Progress	In early design and development phase Design Early design in progress Consenting Early stages in progress Detailed Engineering Still to commence Tendering Still to commence Construction Still to commence Commissioning/Close Out Still to commence Link to related info https://www.spenergynetworks.co.uk/pages/substation_modernisation_and_reinforcement.aspx

SPT-RI-238	**Cumberhead Wind Farm 132kV Collector Substation**
OVERVIEW OF WORKS At the Cumberhead Wind Farm substation site a 132kV air insulated busbar will be installed to facilitate the connection of Cumberhead wind farm and future connections. This 132kV busbar will be looped into the existing Coalburn to Galawhistle 132kV underground cable, utilising two new 132kV underground cable sections (~0.2km each).	
Programme	June 2020
Progress	Design Early design in progress Consenting Early stages in progress Detailed Engineering Still to commence Tendering Still to commence Construction Still to commence Commissioning/Close Out Still to commence Link to related info https://www.spenergynetworks.co.uk/pages/substation_modernisation_and_reinforcement.aspx

SPT-RI-240	**Douglas West Wind Farm 132kV Collector Substation**
OVERVIEW OF WORKS At the Douglas West Wind Farm 132kV substation site, a 132kV air insulated busbar will be installed to facilitate the connection of Douglas West Wind Farm and future connections. This 132kV busbar will be looped into the proposed Coalburn to Middlemuir wind farm 132kV underground cable, utilising two new 132kV underground cable sections (~0.3km each).	
Programme	April 2021
Progress	Design Early design in progress Consenting Location of new 132kV S/S now identified. Detailed Engineering Still to commence. Tendering Still to commence. Construction Still to commence. Commissioning/Close Out Still to commence. Link to related info https://www.spenergynetworks.co.uk/pages/substation_modernisation_and_reinforcement.aspx

SPT-RI-243	Devolmoor-Erskine-Braehead Park Circuit LMS
OVERVIEW OF WORKS A Load Management Scheme (LMS) is required to manage connections in the Neilston – Devol Moor 132 kV group to prevent overloads on the Devol Moor-Erskine-Braehead Park Circuit. The overload will be managed by the LMS tripping the appropriate non-firm connections.	
Programme	September 2020
Progress	In early design and development phase Design Still to commence Consenting Still to commence Detailed Engineering Still to commence Tendering Still to commence Construction Still to commence Commissioning/Close Out Still to commence Link to related info https://www.spenergynetworks.co.uk/pages/substation_modernisation_and_reinforcement.aspx

SPT-RI-244	**Erskine GT1 Protection Modifications**
OVERVIEW OF WORKS PROTECTION MODIFICATIONS The LVDOC relay protecting GT1 at Erskine will need to be modified or replaced to allow for reverse power flow through GT1. The modification is required to allow full reverse power flow at this GSP. This will take one of the following options, depending on detailed engineering solutions: • Relay settings modifications utilising existing relay (currently set with pickup at 50% of Tx rating) • Relay change • Removal of directional element and add in an additional intertrip.	
Programme	April 2020
Progress	In early design and development phase Design Still to commence Consenting Still to commence Detailed Engineering Still to commence Tendering Still to commence Construction Still to commence Commissioning/Close Out Still to commence Link to related info https://www.spenergynetworks.co.uk/pages/substation_modernisation_and_reinforcement.aspx

SPT-RI-246	Denny SGT2
OVERVIEW OF WORKS At Denny North substation, a new 1000MVA 400/275kV supergrid transformer and associated circuit breakers will be installed. This will increase the thermal capacity of Denny North 400kV substation, and across the B4 Boundary, to facilitate the connection of generation in the SHE Transmission area.	
Programme	October 2026
Progress	Design Still to commence Consenting Still to commence Detailed Engineering Still to commence Tendering Still to commence Construction Still to commence Commissioning/Close Out Still to commence Link to related info https://www.spenergynetworks.co.uk/pages/substation_modernisation_and_reinforcement.aspx

SPT-RI-248	**Benbrack Collector Substation**
OVERVIEW OF WORKS A new collector substation will be established at Benbrack wind farm with a 132/33kV 120MVA transformer. An overhead line (Poplar 124MVA) will tee into the New Cumnock – Margree – Glenlee 132kV circuit.	
Programme	May 2023
Progress	Design Early design in progress. Consenting Still to commence. Detailed Engineering Still to commence. Tendering Still to commence. Construction Still to commence. Commissioning/Close Out Still to commence. Link to related info https://www.spenergynetworks.co.uk/pages/substation_modernisation_and_reinforcement.aspx

SPT-RI-251	Coalburn to Douglas West WF 132kV Cable Reinforcement
OVERVIEW OF WORKS It is proposed to install a second 132kV cable in parallel with the existing cable between Coalburn and the proposed Douglas North Collector 132kV substation. A minimum summer continuous rating of 160MVA is required for this second cable without derating the existing cable.	
Programme	May 2024
Progress	In early design and development phase. Design Still to commence. Consenting Still to commence. Detailed Engineering Still to commence. Tendering Still to commence. Construction Still to commence. Commissioning/Close Out Still to commence. Link to related info https://www.spenergynetworks.co.uk/pages/substation_modernisation_and_reinforcement.aspx

SPT-RI-252	Fife 132kV Fault Level Reinforcement
OVERVIEW OF WORKS The following works are required at Mossmorran 132kV substation remove the fault level limitations introduced by the 8 GEC FC1 Circuit Breakers (1983): • Replace CB 210 and associated disconnector/earth switch • Replace CB 280 and associated disconnector/earth switch • Replace CB 310 and associated disconnector/earth switch • Replace CB 380 and associated disconnector/earth switch • Replace CB 405 and associated disconnector/earth switch • Replace CB 415 and associated disconnector/earth switch • Replace CB 505 and associated disconnector/earth switch • Replace CB 515 and associated disconnector/earth switch In addition to the above works, the protections on each bay, including remote ends, are to be replaced in line with the new primary plant.	
Programme	June 2022
Progress	Design Still to commence. Consenting Still to commence. Detailed Engineering Still to commence. Tendering Still to commence. Construction Still to commence. Commissioning/Close Out Still to commence. Link to related info https://www.spenergynetworks.co.uk/pages/substation_modernisation_and_reinforcement.aspx

SPT-RI-253	Coalburn to Cumberhead WF Collector Substation 132kV Cable Reinforcement
OVERVIEW OF WORKS There is an existing 1600mm Al XLPE 132kV cable between Coalburn 132kV substation and Galawhistle WF. The Cumberhead WF 132kV Collector substation will be connected into this cable at a location ~10km from Coalburn. This 132kV cable has a summer continuous rating of 169MVA. It is proposed to install a second 1600mm Al XLPE 132kV cable in parallel with the existing cable between Coalburn and the proposed Cumberhead WF 132kV Collector substation (~10km). A minimum summer continuous rating of 200MVA is required for the circuit (two cables in parallel).	
Programme	May 2024
Progress	Design Still to commence. Consenting Still to commence. Detailed Engineering Still to commence. Tendering Still to commence. Construction Still to commence. Commissioning/Close Out Still to commence. Link to related info https://www.spenergynetworks.co.uk/pages/substation_modernisation_and_reinforcement.aspx

SPT-RI-254	AA Route LMS
OVERVIEW OF WORKS A Load Management Scheme (LMS) is required at Bonnybridge 132 kV substation in order to prevent overload conditions on both the Bonnybridge to Bathgate leg of the Bonnybridge – Bathgate – Drumcross No. 1(2) 132 kV circuit when the adjacent circuit is out of service. The overload will be removed by the LMS scheme managing the appropriate non-firm connections via appropriate LMS outstations. Note that the LMS outstations are to be detailed in separate SPT-RI documents.	
Programme	October 2021
Progress	Design Still to commence. Consenting Still to commence. Detailed Engineering Still to commence. Tendering Still to commence. Construction Still to commence. Commissioning/Close Out Still to commence. Link to related info https://www.spenergynetworks.co.uk/pages/substation_modernisation_and_reinforcement.aspx

SPT-RI-255	Drumcross GSP GT1(2)
OVERVIEW OF WORKS An overload protection (OLP) scheme is required at Drumcross 132/33 kV substation in order to prevent overload conditions on the single transformer when the other transformer is out of service. The overload will be removed by the OLP scheme tripping the appropriate non-firm connections.	
Programme	October 2021
Progress	Design Still to commence. Consenting Still to commence. Detailed Engineering Still to commence. Tendering Still to commence. Construction Still to commence. Commissioning/Close Out Still to commence. Link to related info https://www.spenergynetworks.co.uk/pages/substation_modernisation_and_reinforcement.aspx

SPT-RI-260	Leven GSP GT1(2) OLP Scheme and LMS Outstation
OVERVIEW OF WORKS An overload protection (OLP) scheme is required at Leven 132/33 kV substation in order to prevent overload conditions on the single transformer when the other transformer is out of service. The overload will be removed by the OLP scheme tripping the appropriate non-firm connections.	
Programme	April 2021
Progress	Design Still to commence. Consenting Still to commence. Detailed Engineering Still to commence. Tendering Still to commence. Construction Still to commence. Commissioning/Close Out Still to commence. Link to related info https://www.spenergynetworks.co.uk/pages/substation_modernisation_and_reinforcement.aspx

SPT-RI-261	Cupar-Leven 132 kV Circuits LMS
OVERVIEW OF WORKS A Load Management Scheme (LMS) is required to monitor circuit loadings at: Westfield 132 kV substation in order to monitor for overload conditions on the Westfield-Cupar-Leven 132 kV circuit. Redhouse 132 kV substation in order to monitor for overload conditions on the Redhouse-Cupar-Leven 132 kV circuit. IED to be installed a Cupar GSP to act an LMS outstation to complete the communications channel.	
Programme	April 2021
Progress	Design Still to commence. Consenting Still to commence. Detailed Engineering Still to commence. Tendering Still to commence. Construction Still to commence. Commissioning/Close Out Still to commence. Link to related info https://www.spenergynetworks.co.uk/pages/substation_modernisation_and_reinforcement.aspx

SPT-RI-263	Coalburn SGT4
OVERVIEW OF WORKS At Coalburn 400/132kV substation, works will be required to extend the compound to facilitate the extension of the 400kV and 132kV double busbars, installation of a fourth supergrid transformer (SGT4), along with the associated switchbays. In addition, alterations will be made to the 400kV busbars to provide a Main and Reserve busbar, and the 132kV busbars to form two separate switchboards ("A" and "B" board). Modifications will be made to the exisiting load management scheme on SGT1, SGT2 and SGT3 to monitor only SGT1 and SGT2 whilst an additional scheme will be installed to monitor SGT3 and SGT4. The diverting of three of the 132kV cable circuits into Coalburn has been allowed for to ensure that the generation is split appropriately across the "A" and "B" 132kV switchboards. These works will provide additional capacity at Coalburn for generation connecting to the associated transmission and distribution network.	
Programme	May 2024
Progress	Design Still to commence. Consenting Still to commence. Detailed Engineering Still to commence. Tendering Still to commence. Construction Still to commence. Commissioning/Close Out Still to commence. Link to related info https://www.spenergynetworks.co.uk/pages/substation_modernisation_and_reinforcement.aspx

SPT-RI-268	Coalburn to Douglas West 132kV cable rating enhancement
OVERVIEW OF WORKS The cable currently installed between Coalburn 132kV and Douglas West collector substation is an 800mm2 AL XLPE (~5km) with its rating limited to 144MVA. The limiting sections for the rating are: i) Linnmill 132kV cable crossing (first section out of Coalburn 132kV s/s) - 150MVA limit. ii) HDD section at Poniel water (11.46m) – 146MVA limit It is proposed to relay these two sections with a larger capacity cable to enhance the thermal ratings on this circuit to 165MVA.	
Programme	October 2021
Progress	Design Still to commence. Consenting Still to commence. Detailed Engineering Still to commence. Tendering Still to commence. Construction Still to commence. Commissioning/Close Out Still to commence. Link to related info https://www.spenergynetworks.co.uk/pages/substation_modernisation_and_reinforcement.aspx

SPT-RI-274	**Glenshimmeroch Collector Substation**
OVERVIEW OF WORKS On the New Cumnock / Blackcraig 132kV circuit, installation of a 132kV circuit breaker and associated disconnectors at Glenshimmeroch Collector Substation in South West Scotland. Sufficient accommodation should be made for a tee between the circuit breaker and the disconnector on the Blackcraig wind farm side.	
Programme	October 2025
Progress	Design Still to commence. Consenting Still to commence. Detailed Engineering Still to commence. Tendering Still to commence. Construction Still to commence. Commissioning/Close Out Still to commence. Link to related info https://www.spenergynetworks.co.uk/pages/substation_modernisation_and_reinforcement.aspx

SPT-RI-275	Mark Hill 132kV Bus
OVERVIEW OF WORKS To increase the utilisation of the available capacity at Mark Hill substation it is proposed to create a new 132kV Board by coupling both supergrid transformers SGT2 and SGT3. To achieve this it is proposed to install a 132kV bus section breaker and share the available capacity on both transformers.	
Programme	October 2026
Progress	Design Still to commence. Consenting Still to commence. Detailed Engineering Still to commence. Tendering Still to commence. Construction Still to commence. Commissioning/Close Out Still to commence. Link to related info https://www.spenergynetworks.co.uk/pages/substation_modernisation_and_reinforcement.aspx