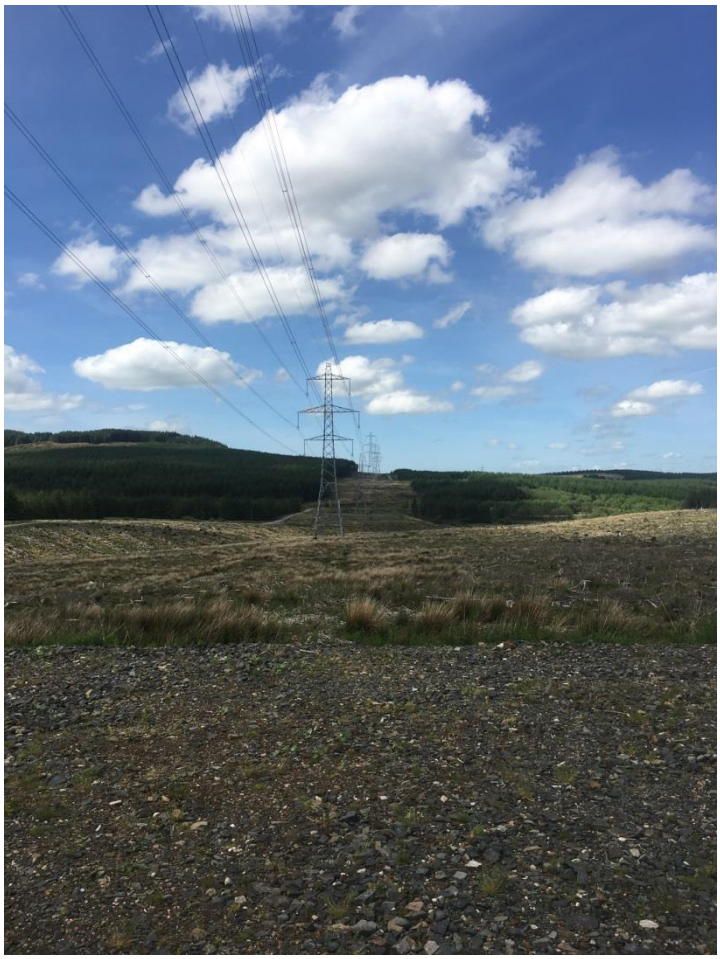
SP Energy Networks
Transmission Owner Reinforcement Instruction (TORI)
Quarterly Update Report
July 2018 to September 2018



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 Visual mitigation and 132kV wirescape rationalisation works completion planned for completion March 2019
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.

Programme	Completion:- TBC subject to Network Options Assessment (NOA) Process and potential Ofgem Strategic Wider Work (SWW) (Earliest In Service Date)
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 50°C operation to 275kV 65°C 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 65°C, 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.

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-022	Black Hill 132 kV Substation- Glenglass 132kV Substation OHL and Glenglass 132kV S/S

OVERVIEW OF WORKS

Construction of a new 132kV double circuit between Blackhill and Glenglass substations. At Blackhill substation two new 132kV bays will be established, the bays will connect to the terminal tower via a cable section approximately 300m in length, cable sealing end compounds will be established at the tower base. A new L7 132kV overhead line approximately 13km in length to Glenglass substation will be established. Glenglass substation will incorporate two 132/33kV 90MVA transformers and 33kV switchboard (single busbar) with a bus-section. These works will be required in response to new generation connections in the vicinity of Glenglass Substation.

Programme	Completion:- August 2018
Progress	Design Complete. Consenting: Complete. Access road upgrade to Glenglass substation complete. All OHL Land agreements secured Quarry planning consent conditions discharged. Detailed Engineering SI's and tower micro-siting works complete. Tendering OHL / tree cutting / platform / transformer / switchgear / substation civil / electrical contracts placed. Construction Site tree cutting complete SP contractor / 80m OHL route corridor now cleared. Electrical installation works at Glenglass complete Pre-commissioning complete. OHL Access construction 100% complete. OHL Foundations works continue 100% complete OHL Tower erection works continue 100%complete. OHL Conductor installation works circuit No2 and 1 complete. Quarry operations continue at Wellhill / Brownhill Rigg Quarries.

	Commissioning/Close Out Link to related info http://www.spenergynetworks.co.uk/pages/south_west_scotland_connections_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 November 2018 Scope 3 October 2023
Progress	Design Scope 1: Complete Scope 2: Complete Scope 3: In progress Consenting Scope 1: Not required Scope 2: Complete Scope 3: Not commenced Detailed Engineering Scope 1: Complete Scope 2: Complete Scope 3: Not commenced Tendering Scope 1: Complete Scope 2: Complete Scope 3: Not commenced Construction Scope 1:Complete Scope 2: In progress, approx. 85% complete

	Scope 3: Not commenced Commissioning/Close Out Scope 1: Complete Scope 2: Scheduled for Oct ’18. Scope 3: Not commenced

SPT-RI-034	Margree 132_33kV Collector Substation

OVERVIEW OF WORKS

A 132/33kV substation will be established, adjacent to Margree wind farm, near St Johns Town of Dalry, in Dumfries and Galloway. The substation will be connected to a new 132kV circuit from New Cumnock 275/132kV substation (SPT-RI-111). It will provide a local 33kV point of connection for renewable generation in the area.

Programme	Completion:- September 2020
Progress	Design – Under review following termination of 1 x windfarm connection. Consenting: Complete Agreement received to Construct TORI 111 OHL through Margree site pending Margree S/S construction Margree substation lease concluded. Access road widening Margree substation negotiations concluded to secure rights to widen access road. Legal agreements to finalise with landowners. Detailed Engineering Under review following termination of 1 x windfarm connection. Tendering To commence Q4 2018 Construction Programme revised to align with revised connection dates. Commissioning/Close Out Under review Link to related info https://www.spenergynetworks.co.uk/pages/blackcraig_and_margree_wind_farm_connection.aspx

SPT-RI-111	New Cumnock – South West 132kV Reinforcements

OVERVIEW OF WORKS

The Kendoon to Maybole T 132kV single circuit will be mostly decommissioned and a new high capacity 132kV double circuit will be established out of New Cumnock substation. The new double circuit will run from New Cumnock to a point approximately 3km north of Kendoon substation where the two circuits will run separately from this point. One circuit will connect to the existing line to Kendoon whilst the second will continue to Margree substation. At New Cumnock substation a new single busbar 132kV board will be established (Board B) to connect two new 275/132kV 240MVA auto transformers to the 275kV system.

Programme	Completion:- Complete
Progress	Design Complete. Consenting: Complete OHL Land secured. Planning permission secured for quarries. Detailed Engineering SI's and tower micro-siting complete Tendering OHL / tree cutting / platform / transformer / civil and switchgear / electrical work / cable contracts placed. Construction Steel Tower OHL Site tree cutting complete Access works 100% of total complete. Foundation works 100% complete Tower erection 100% complete. OHL Conductor installation works commenced 100% complete Construction Heavy Duty Wood Pole Site tree cutting complete Access works 100% of total complete. Structure erection 100% complete. OHL Conductor installation 100% complete Additional OHL contractors deployed / Weekly escalation meetings continue with OHL contractors to track rate of progress against

	revised programme. Substation works at New Cumnock complete. Commissioning/Close Out Feb 2018 planned energisation date. Link to related info http://www.spenergynetworks.co.uk/pages/south_west_scotland_connections_project.asp

SPT-RI-120	Scotland-England Interconnection – Series Compensation (Eccles/Moffat/Gretna)

OVERVIEW OF WORKS

The insertion of series capacitors into existing 400kV transmission circuits to reduce overall circuit reactance and consequently improve transient stability performance and steady state voltage performance.

Power system analysis confirms that reducing the reactance of the circuits on the following overhead line routes, by approximately 35%, is sufficient to raise the transient stability limit on the Scotland-England interconnection towards the 4400MW thermal capability:

- Strathaven-Harker 400kV double circuit;
- Eccles-Stella West 400kV double circuit; and
- Harker-Hutton 400kV double circuit (NGET).

This assumes the Strathaven-Wishaw-Kaimes-Smeaton 275kV circuits are uprated to 400kV operation as described in SPT-RI-121.

Programme	Complete
Progress	Design Complete Consenting Complete Detailed Engineering Complete Tendering Complete Construction All Series Compensation Platforms now complete. Moffat and Gretna units are in service Completion. Moffat – complete in service Gretna – Complete in service Eccles – Complete in service. Link to related info https://www.spenergynetworks.co.uk/pages/mscdn_series_compensation.aspx

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
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 repair works for these occurrences are due to be complete in 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 Early design phase currently in progress. 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:- Dec 2020
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 2017 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 2018

Programme	Completion:- TBC subject to Network Options Assessment (NOA) Process and potential Ofgem Strategic Wider Work (SWW)
Progress	Design Early engineering design phase re-initiated 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 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 – July 2018 Consenting Still to be commenced – July 2018 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 165MVA per circuit. For the overhead line section, It is anticipated that reconductoring to achieve the proposed rating will be carried out. It is also proposed to reinforce the existing 132kV busbars/isolators at Innerwick 132kV substation to accommodate the minimum rating of 165MVA of the reinforced circuits.

Programme	Completion:- October 2021
Progress	Design Surveys and pre-engineering studies ongoing. Consenting Title search completed and consenting against planned route. Land consents forecast completion Q3 2019. 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 Progressing following completion of the initial engineering design phase. Tendering All main contracts now placed with exception of telecommunications works. Construction 275kV and 400kV GIS building substantially complete – GIS and GIB installation underway. Civils and Balance of Plant contract works ongoing. SGT6 being installed. 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 Initial engineering design phase complete and now progressing through the detailed engineering phase. Consenting - No consents required Detailed Engineering Largely completed Tendering 360MVA 400/132kV transformer contract awarded June 2017. All main contracts now awarded Construction Works commenced 28th May 2018 Civils works progressing – BoP contractor to commence late October 2018 Commissioning/Close Out Still to be commenced. 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. 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 2019
Progress	Design Initial engineering design phase complete, now progressing through detailed engineering. Consenting Detailed discussions with landowners still progressing however voluntary consents now looking unlikely. Current programme includes requirement for Statutory process leading to October 2019 completion date. Statutory process initiated with a view to start construction works in 2019. Detailed Engineering Progressing detailed engineering following completion of the initial engineering design phase. Tendering Tendering for main plant and cable works now delayed due to consenting issues. Construction Still to be commenced, anticipated start date Q2 2019 due to the above consenting issues. Commissioning/Close Out

	Still to be commenced, completion date October 2019 now being reviewed based on consenting issues. 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 SGT2C 240MVA auto wind transformers, providing a total firm capacity of 480MVA

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 Consenting Still to be commenced – Q3 2018 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-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:- March 2020
Progress	Design In Progress Consenting Planning consent approved. SEPA CAR license applied for Detailed Engineering Complete Tendering Civil contract awarded Q1 2016 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 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-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 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-181	Coalburn – Kype Muir 132kV Circuit
OVERVIEW OF WORKS A 132kV switchbay will be installed at Coalburn substation. From this a 132kV circuit, consisting of 17km underground cable, and associated fibre optic cable, will be installed to the Kype Muir Collector Substation where a 132kV switchbay will be installed to terminate the circuit. This will facilitate the connection of generation around the Kype Muir Wind Collector Substation area.	
Programme	Completion October 2018
Progress	Design Initial engineering phase complete Consenting All wayleaves secured. Detailed Engineering Detailed Design complete Tendering All main contracts placed. Construction Cable civil ducting complete –delays have impacted programme. Cable works programme being accelerated to recover time – however works will not be complete until Mid-October Civil and Control Building works progressing well at Kype Muir substation. Coalburn civils complete – BoP contractor commenced works Commissioning/Close Out Still to be commenced, completion now planned for October 18 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 2020
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 June 2020 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:- March 2022
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 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-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 Consenting No consenting 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-198	Newton Stewart 132kV Substation Works
OVERVIEW OF WORKS At Newton Stewart 132/33kV substation, it is proposed to install a second 132/33kV transformer in order to accommodate contracted generation on a firm basis. In doing so, further substation works involving 132kV switchbay and line isolators are required 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 Still to be commenced - Subject to Network Options Assessment (NOA) Process 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 Early design in progress Consenting Not 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 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 took place recently and responses are being reviewed in order to confirm the route to be taken forward. 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 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-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 Early design in progress Consenting Complete Detailed Engineering Complete Tendering Complete Construction In progress Commissioning/Close Out Still to be commenced 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:- September 2022
Progress	Design Early design in progress 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 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 Early design in progress with site surveys being complete in Q1 2018. Consenting Review of consents requirements underway. Detailed Engineering Underway Tendering Civil tender to be issued to market shortly Construction Still to be commenced – Anticipated start Q1 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-217	**Coalburn – Dalquhandy Collector Substation 132kV Circuit**
OVERVIEW OF WORKS A 132kV switchbay will be installed at Coalburn substation in an existing spare bay. From this, ~0.1km of 132kV underground cable will connect to the existing underground cable for Galawhistle wind farm, to divert this circuit into this new switchbay. From the ex Galawhistle wind farm 132kV switchbay, a 132kV circuit consisting of 1.3km of 1600mm Al XPLE underground cable, and 4.1km of 300mm UPAS wood pole overhead line, will be installed to the Dalquhandy Collector substation.	
Programme	Completion:- September 2021
Progress	Design Early design in progress with site surveys carried out in Q4 2017 Consenting Route option environmental work progressing. Preferred route established following public consultation process. 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-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:- May 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 The Enabling tender package is with Procurement; however, will not be issued to market until agreements are in place with landowners surrounding the substation. Consenting Section 37 application anticipated in Q2 2019 Detailed Engineering Started Tendering Oh hold 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 Early design in progress Consenting Section 37 application anticipated in Q2 2019 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-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 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 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-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 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-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 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-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:- April 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 It is proposed to increase the thermal rating of the Glenniston to Mossmorran No.2 132 kV Circuit at Glenniston 132kV substation. This is to be achieved by: • Replacing the Mossmorran No. 2 132kV disconnector and associated busbars. • Replacing the main 132kV oversailing conductor/busbar as well as 132kV disconnectors 124 and 128 and bus section circuit breaker 120. In addition, at Glenniston and Mossmorran 132kV substations carry out a protection study to identify any protection limitations that account for the Glenniston to Mossmorron No.132kV circuit currently being rated in the Site Capability Schedule (SCS) below the primary plant ratings. Carry out any protection works as required to remove any protection limitations identified on this circuit, and also at the Glenniston and Mossmorron 132kV substations.	
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-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 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

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 132kV wood pole overhead line circuit, with 200mm^2 POPLAR conductor, 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	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

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

SPT-RI-239	**Coalburn to Douglas West WF 132kV Collector Substation**
OVERVIEW OF WORKS A 132kV switchbay will be installed at Coalburn 132kV substation. From this a 132kV underground cable circuit will be established to the Douglas West Wind Farm 132kV Substation (**SPT-RI-240**).	
Programme	Programme under review
Progress	

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 Consenting requirements under review. Detailed Engineering Still to commence. Tendering Still to commence. Construction Still to commence. Commissioning/Close Out Still to commence. Link to related info

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	
Progress	

SPT-RI-245	**Redhouse GSP GT1 & GT3 OLP Scheme**
OVERVIEW OF WORKS SPT GT1 & GT3 OLP SCHEME A directional overload protection (OLP) scheme is required at Redhouse 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. PROTECTION MODIFICATIONS The LVDOC relays protecting GT1 and GT3 at Redhouse will need to be modified or replaced to allow for reverse power flow through GT1 and GT3. The modification is required to allow full reverse power flow.	
Programme	June 2020
Progress	Design Early design in progress Consenting Not Applicable Detailed Engineering Still to commence. Tendering Still to commence. Construction Still to commence. Commissioning/Close Out Still to commence. Link to related info

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