

UKOPA Mutual Energy Pipeline System

Emmet McFadden
Gas Operations Manager
27th February 2018

Contents

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- NI Gas Network Development
- What does it mean to be a mutual?
- PTPS Integrity Management System
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Northern Ireland

Scotland

England

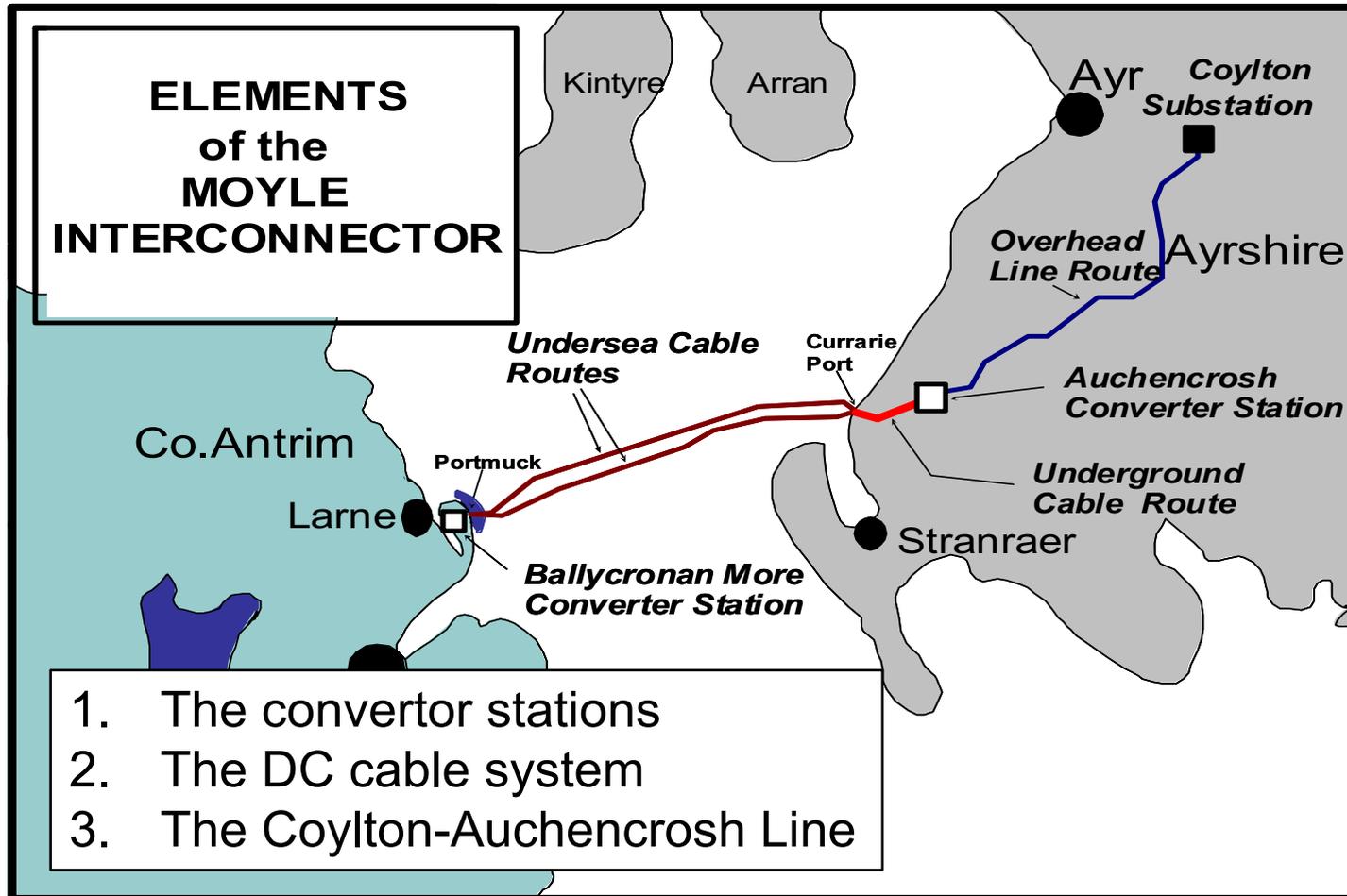
premier
TRANSMISSION

Scotland to Northern Ireland High Pressure natural gas transmission pipeline providing all natural gas to NI & Belfast Gas Transmission Pipeline

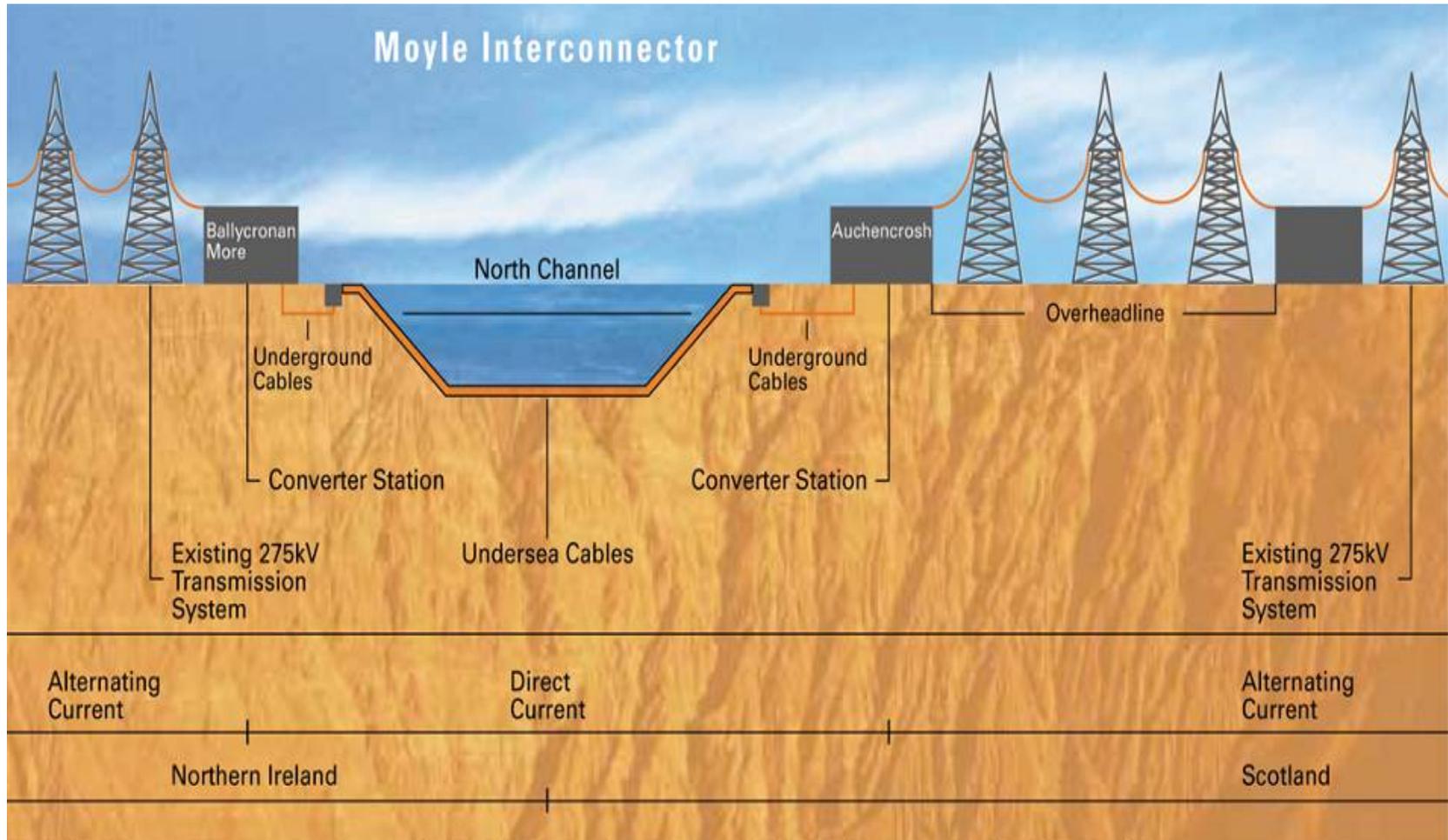
 **moyle**
interconnector

500MW HVDC Interconnector providing market link between Irish & GB Electrical wholesale markets

Three Key Elements of Moyle Availability! Availability! Availability!

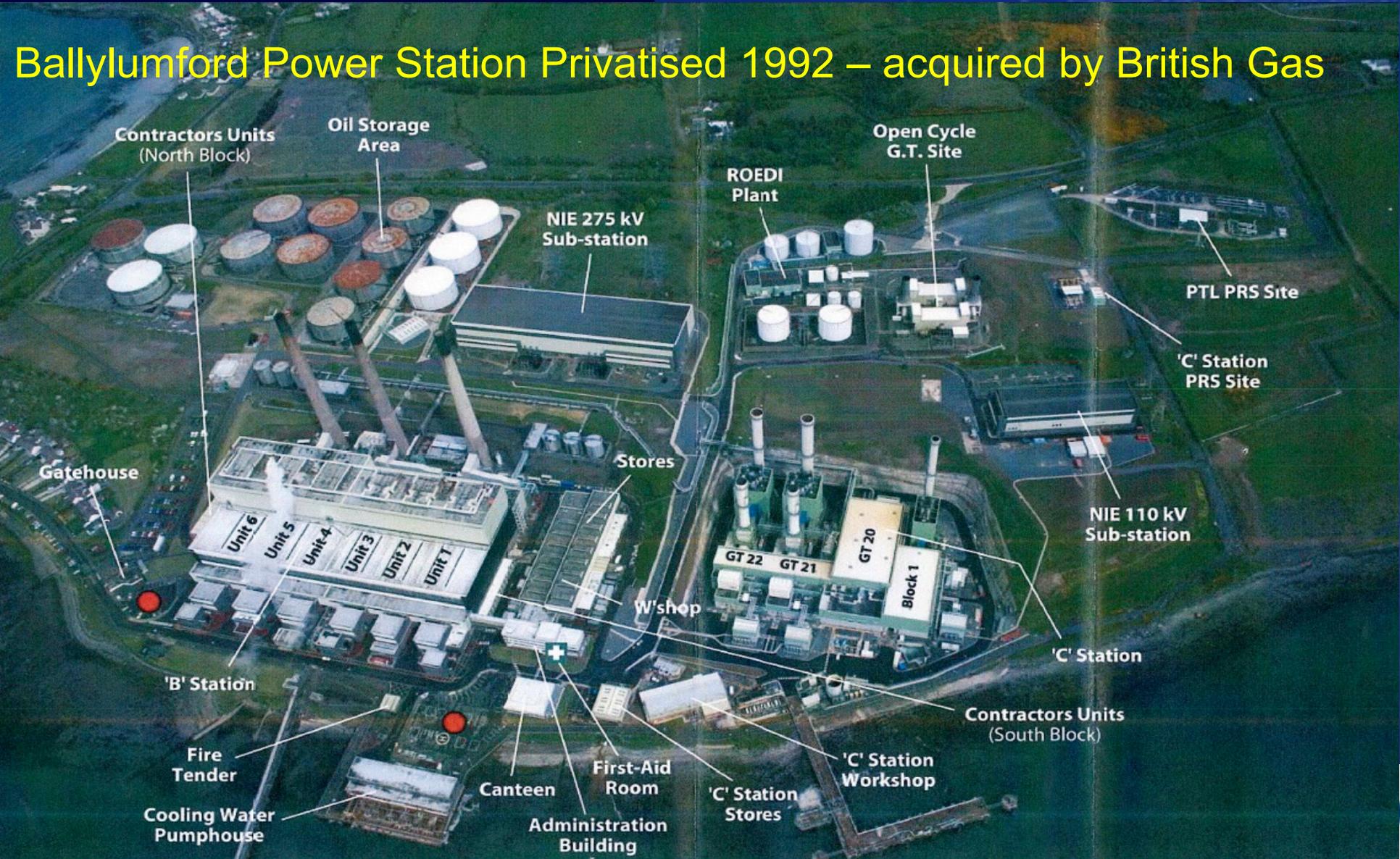


System Overview



NI Gas Network Development

Ballylumford Power Station Privatised 1992 – acquired by British Gas



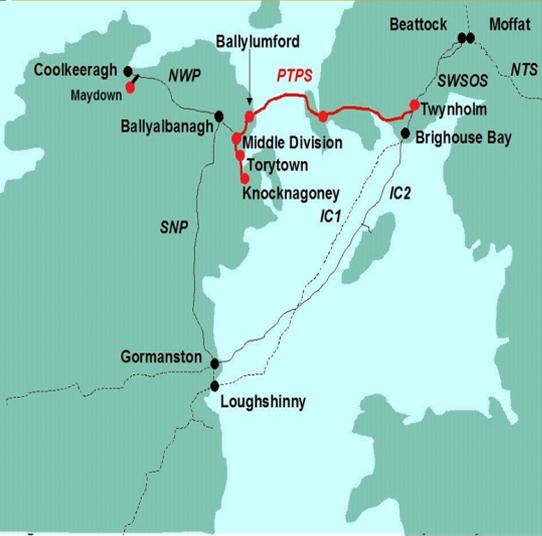
NI Gas Network Development

British Gas

Premier
Transmission Ltd
(PTL)

Premier Power Ltd
(AES Ballylumford)

Premier Energy
Services
Phoenix Nat Gas



NI Gas Network Development

British Gas

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Transmission Ltd
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Services
Phoenix Nat Gas



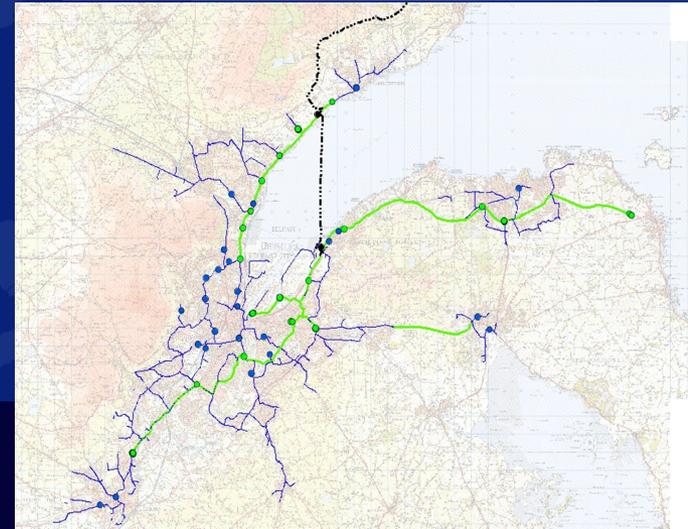
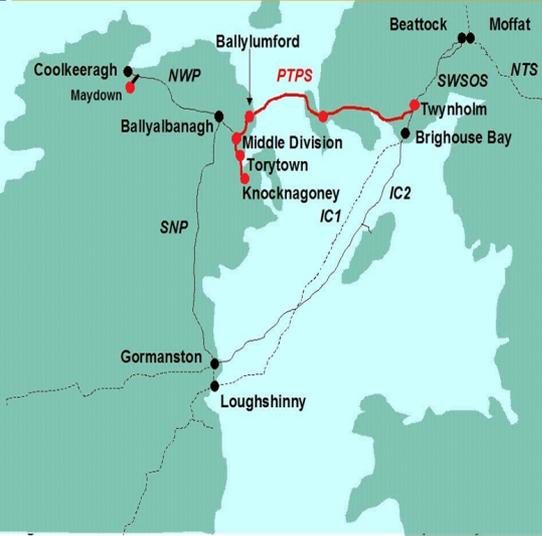
NI Gas Network Development

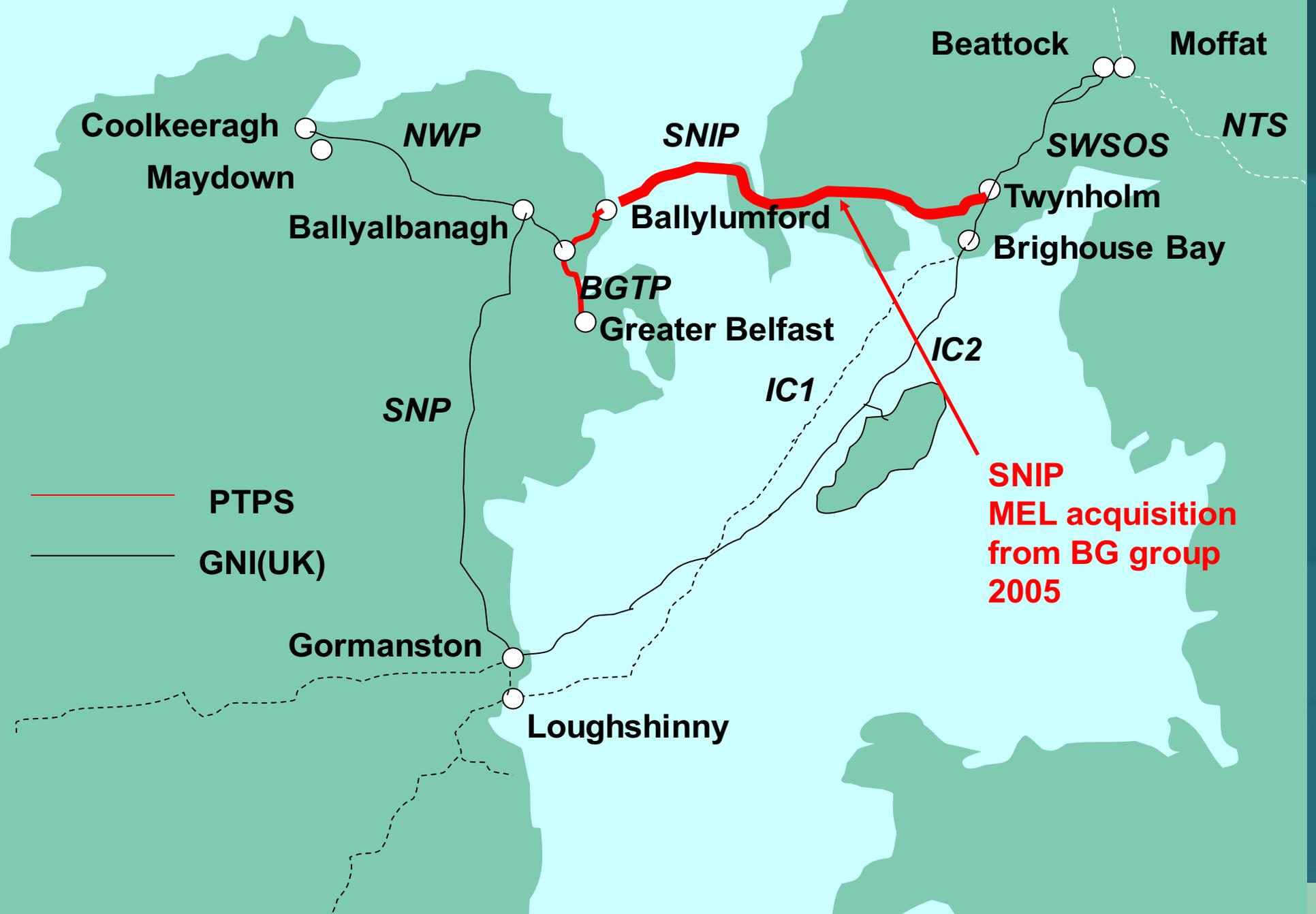
British Gas

Premier Transmission Ltd
(PTL)

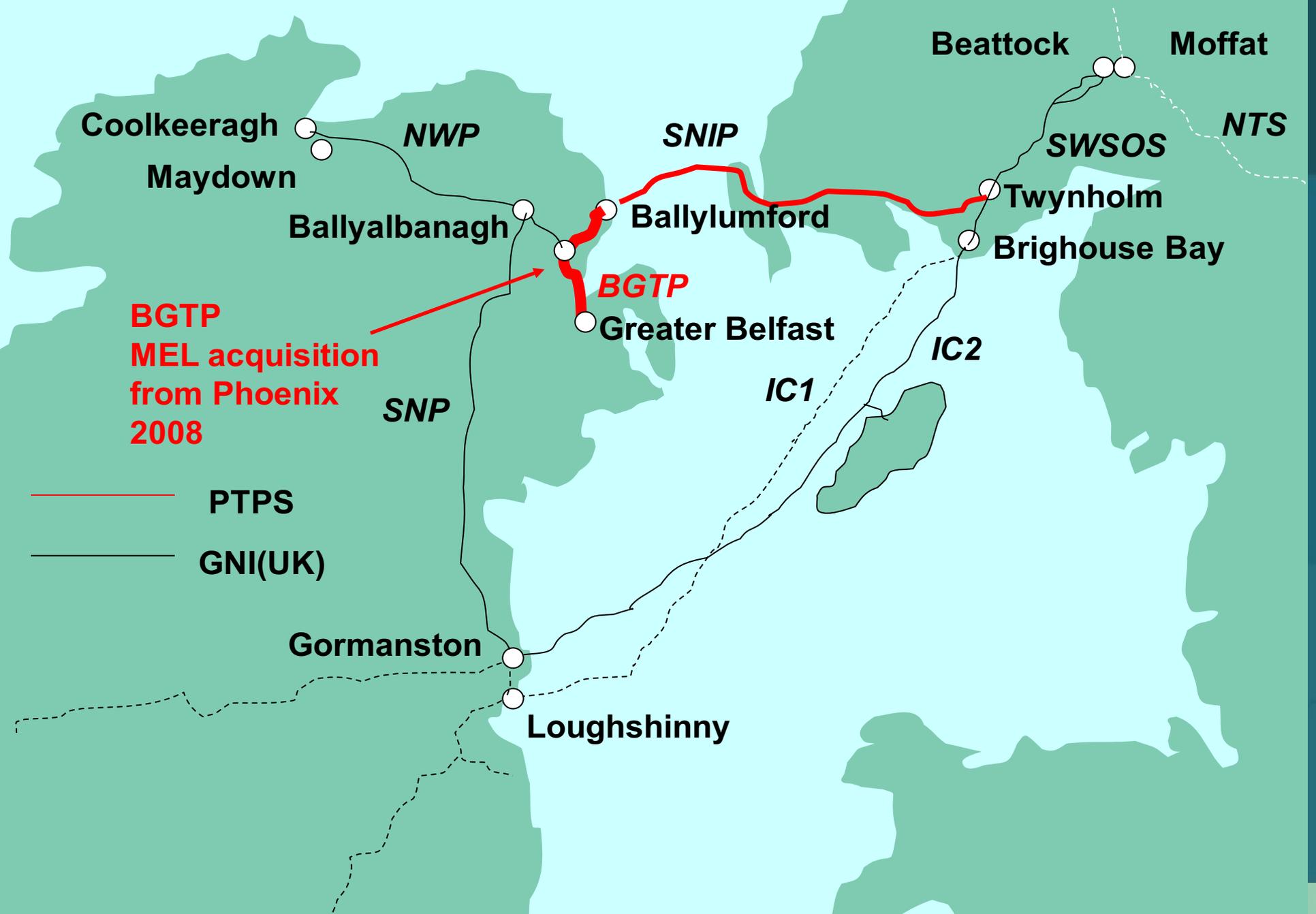
Premier Power Ltd
(AES Ballylumford)

Premier Energy Services
Phoenix Nat Gas





Northern Ireland Transmission Pipeline System

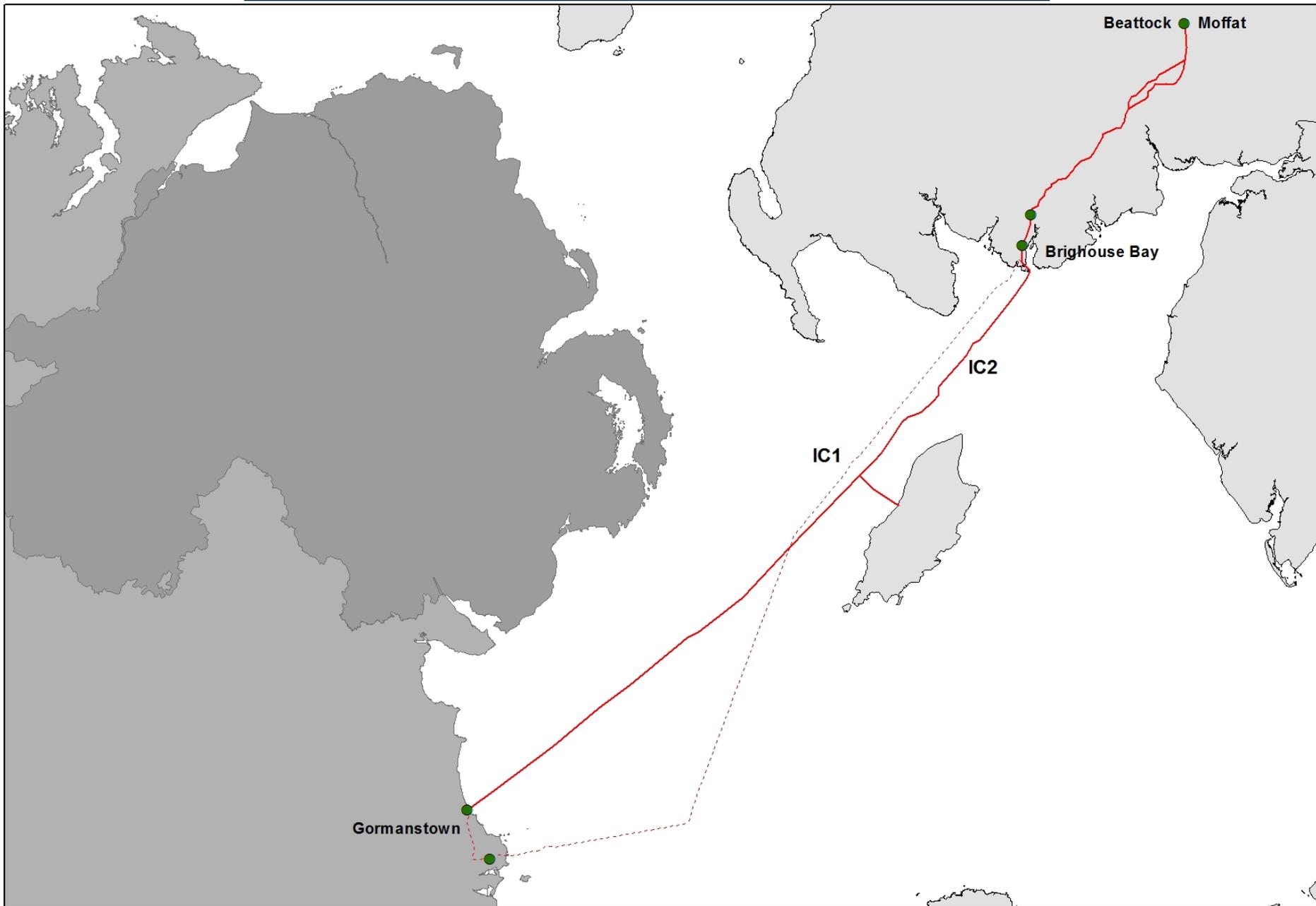


Northern Ireland Transmission Pipeline System

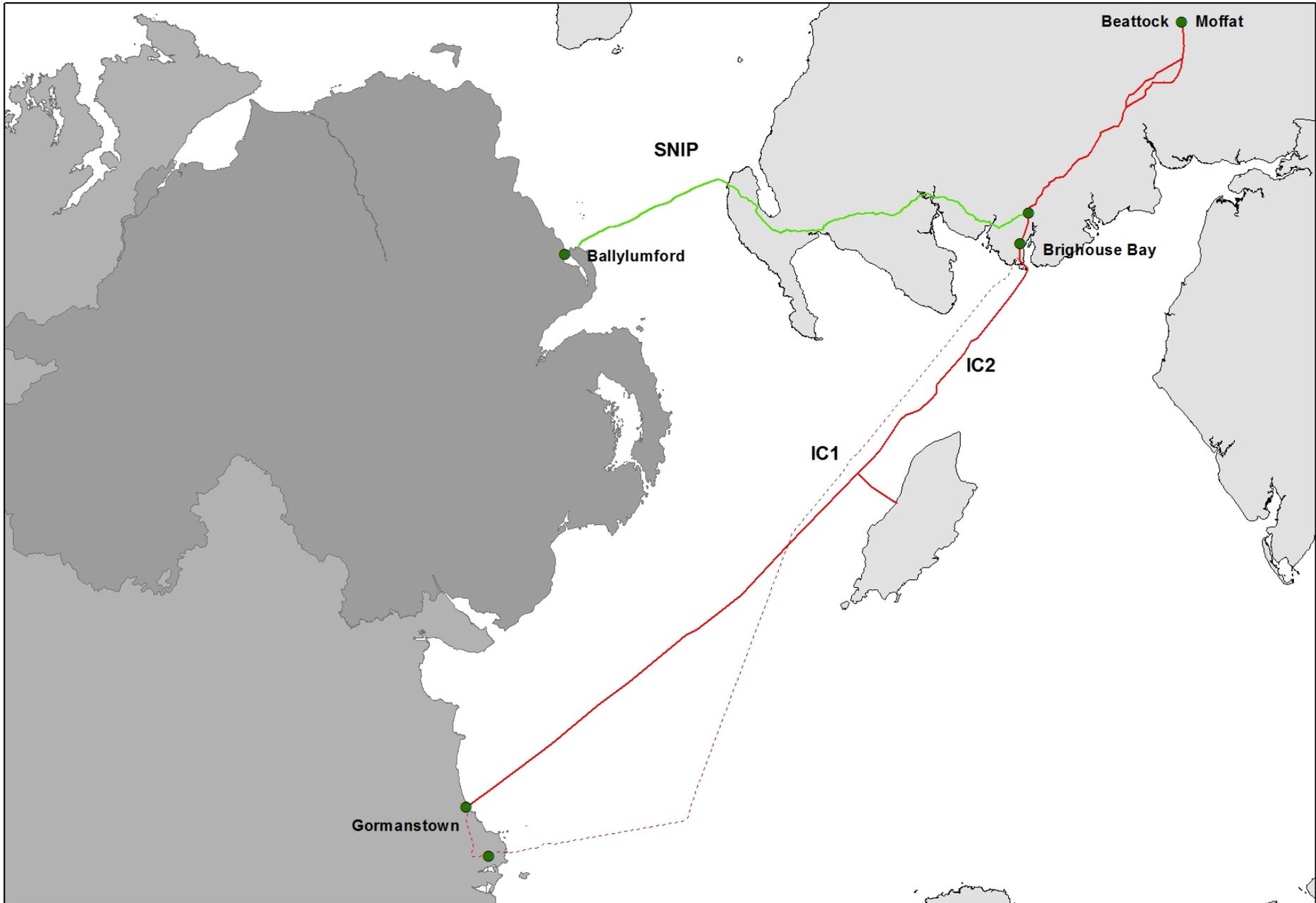
Northern Ireland Gas Network



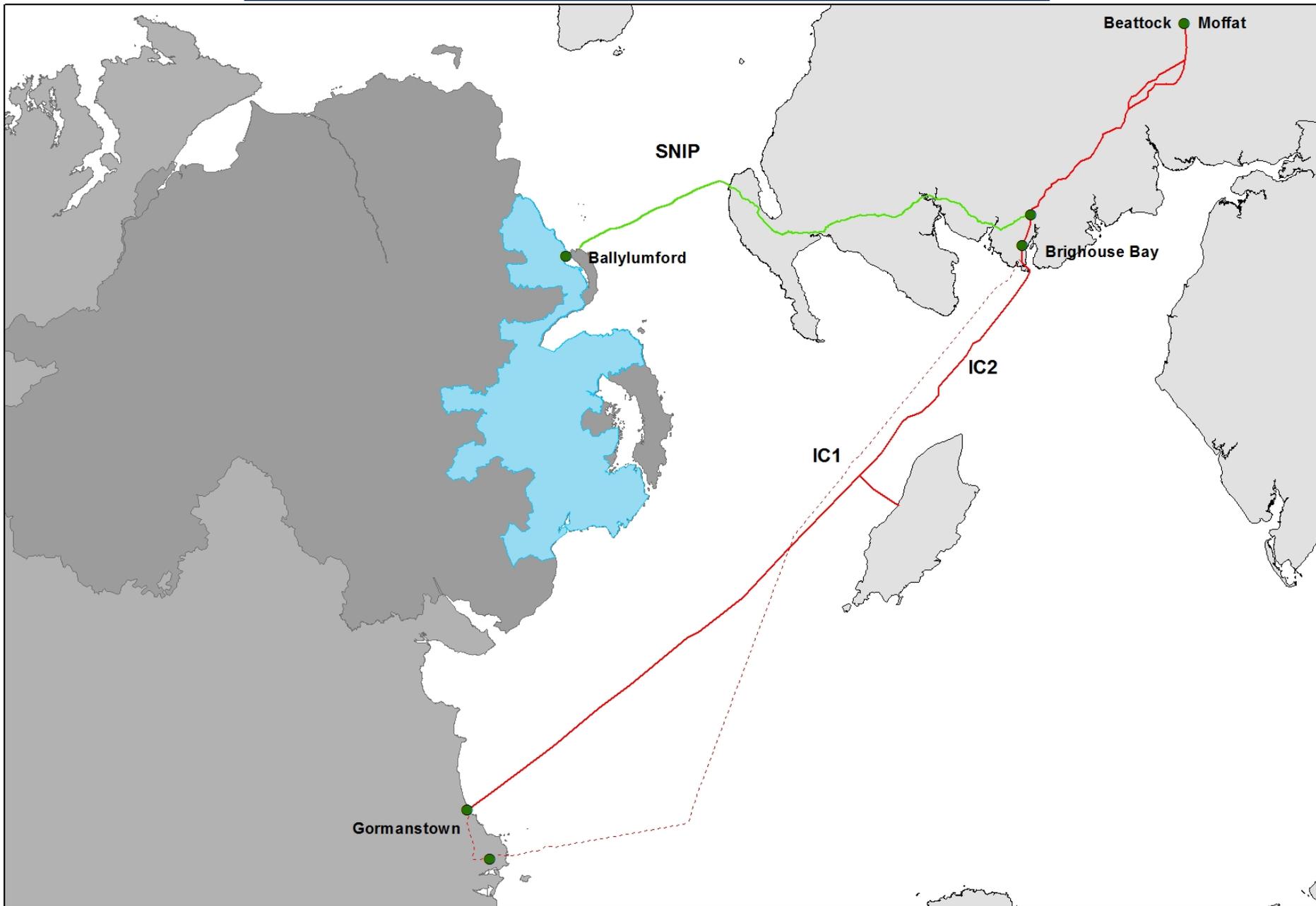
Northern Ireland Gas Network



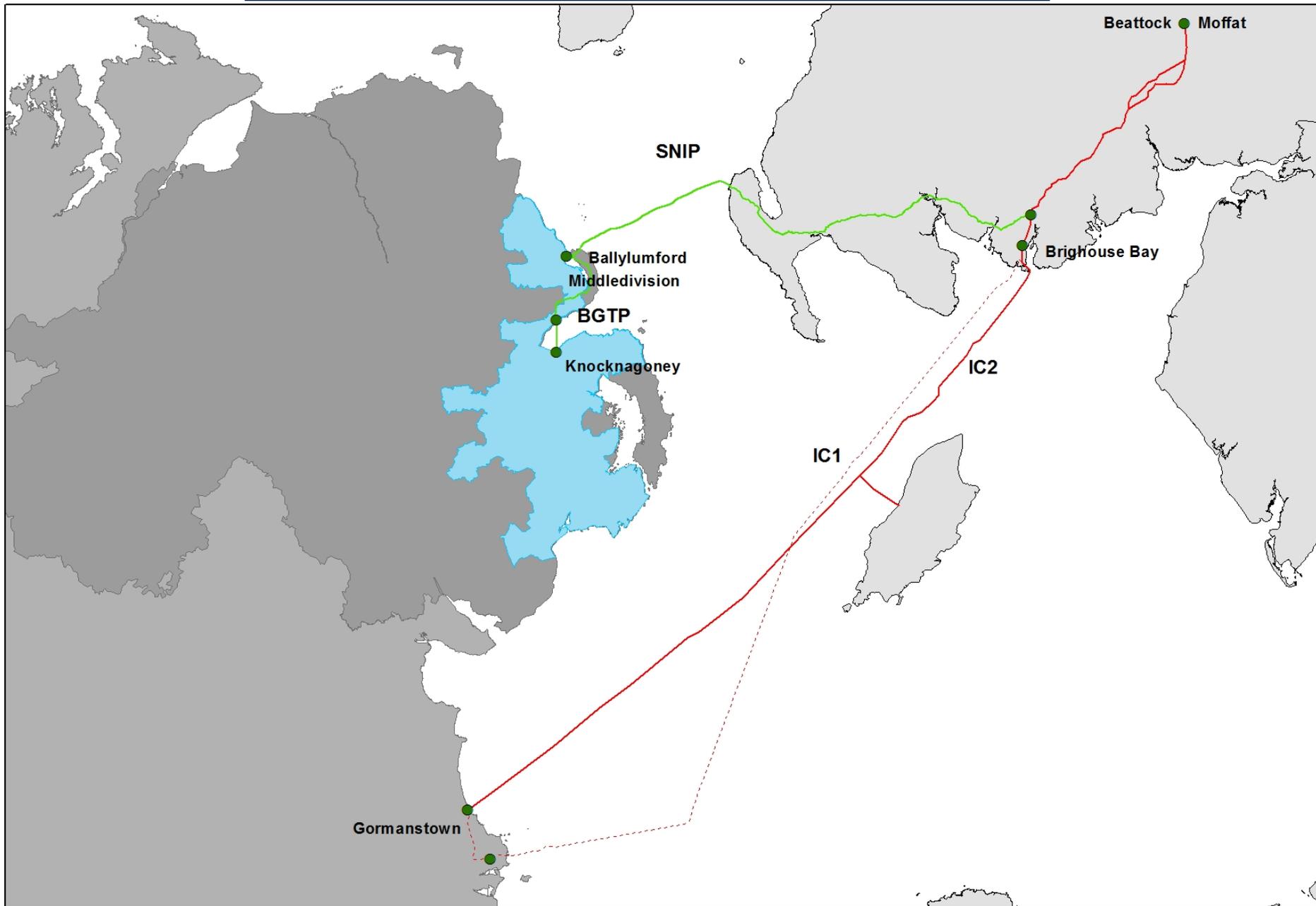
Northern Ireland Gas Network



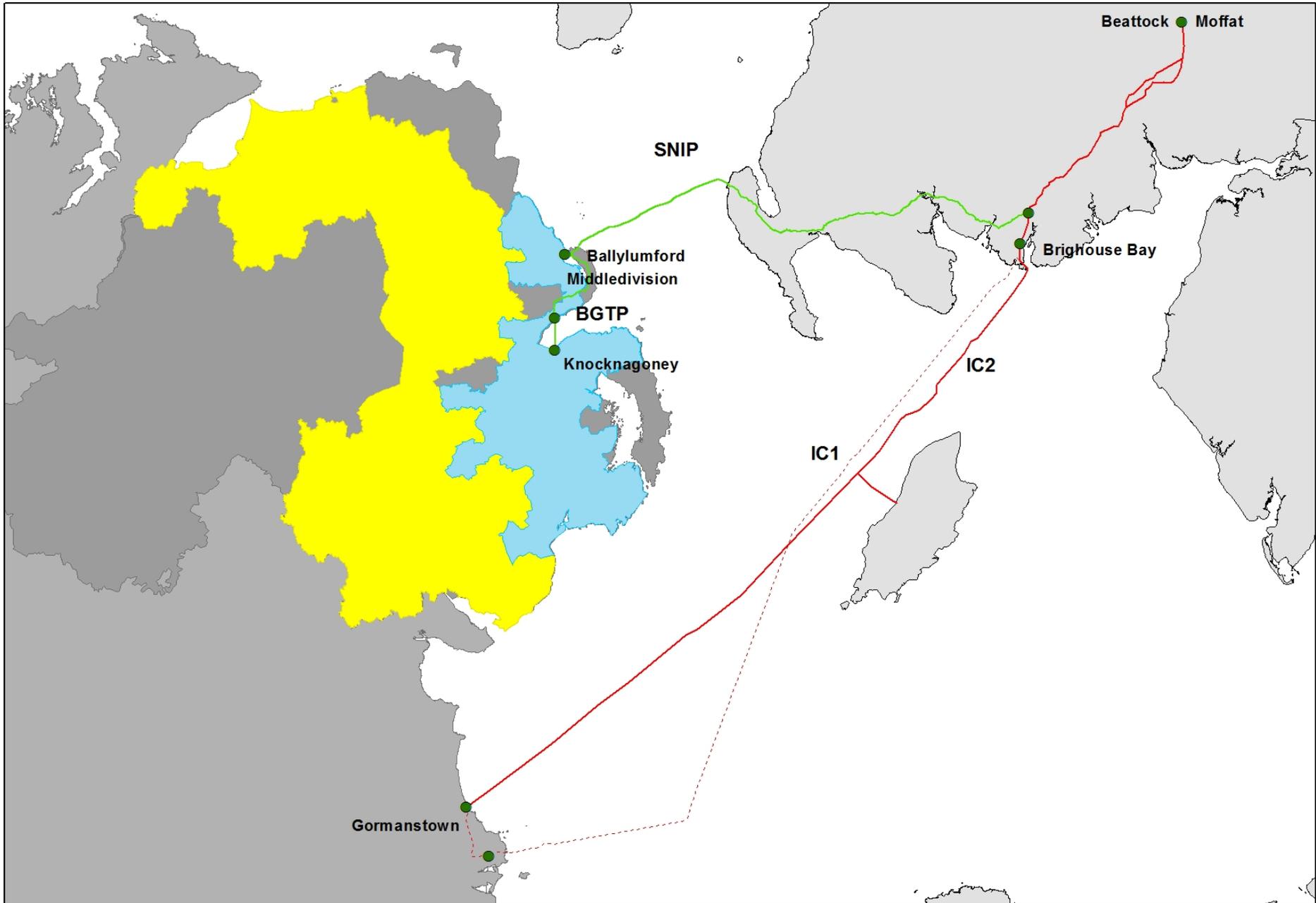
Northern Ireland Gas Network



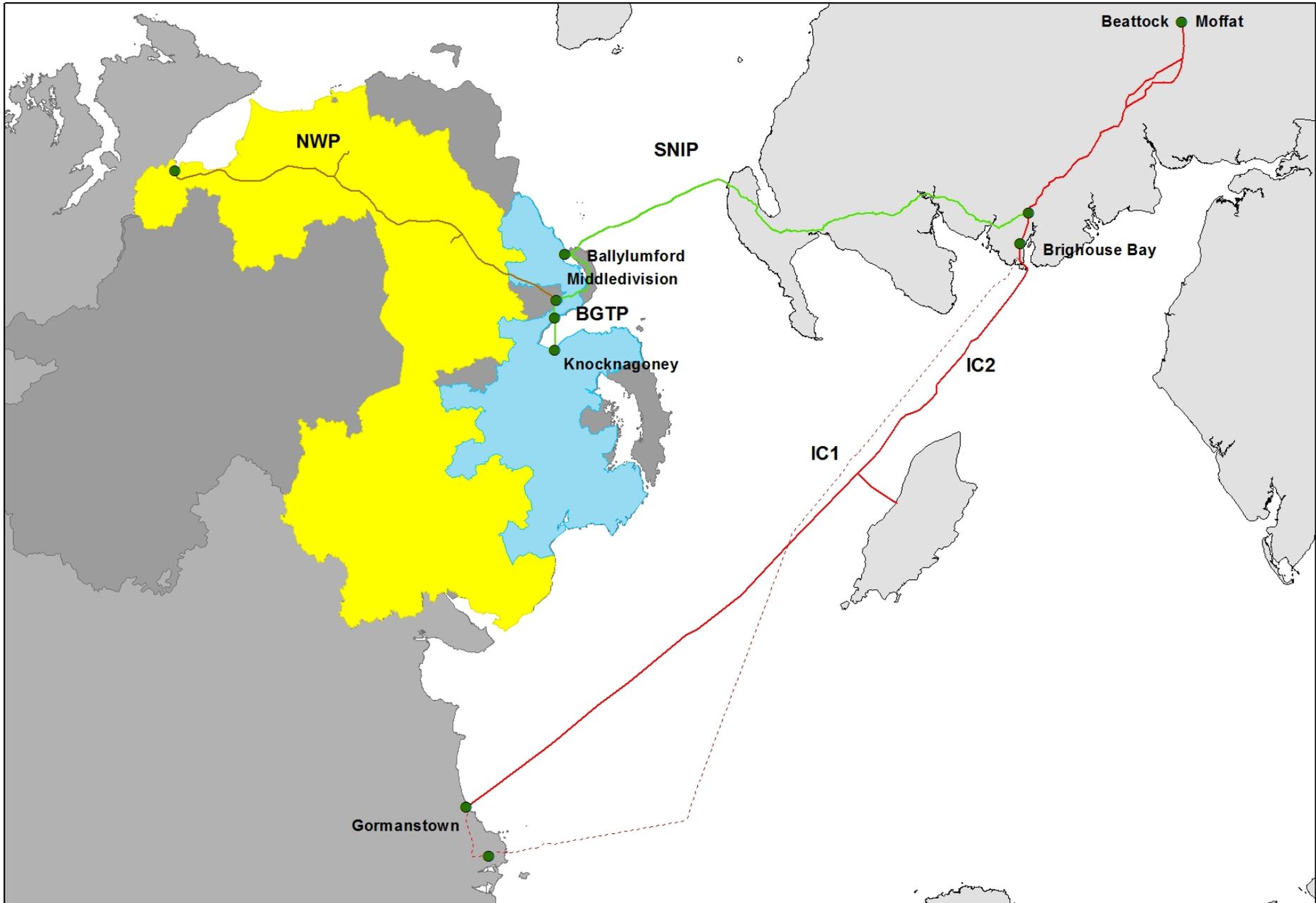
Northern Ireland Gas Network



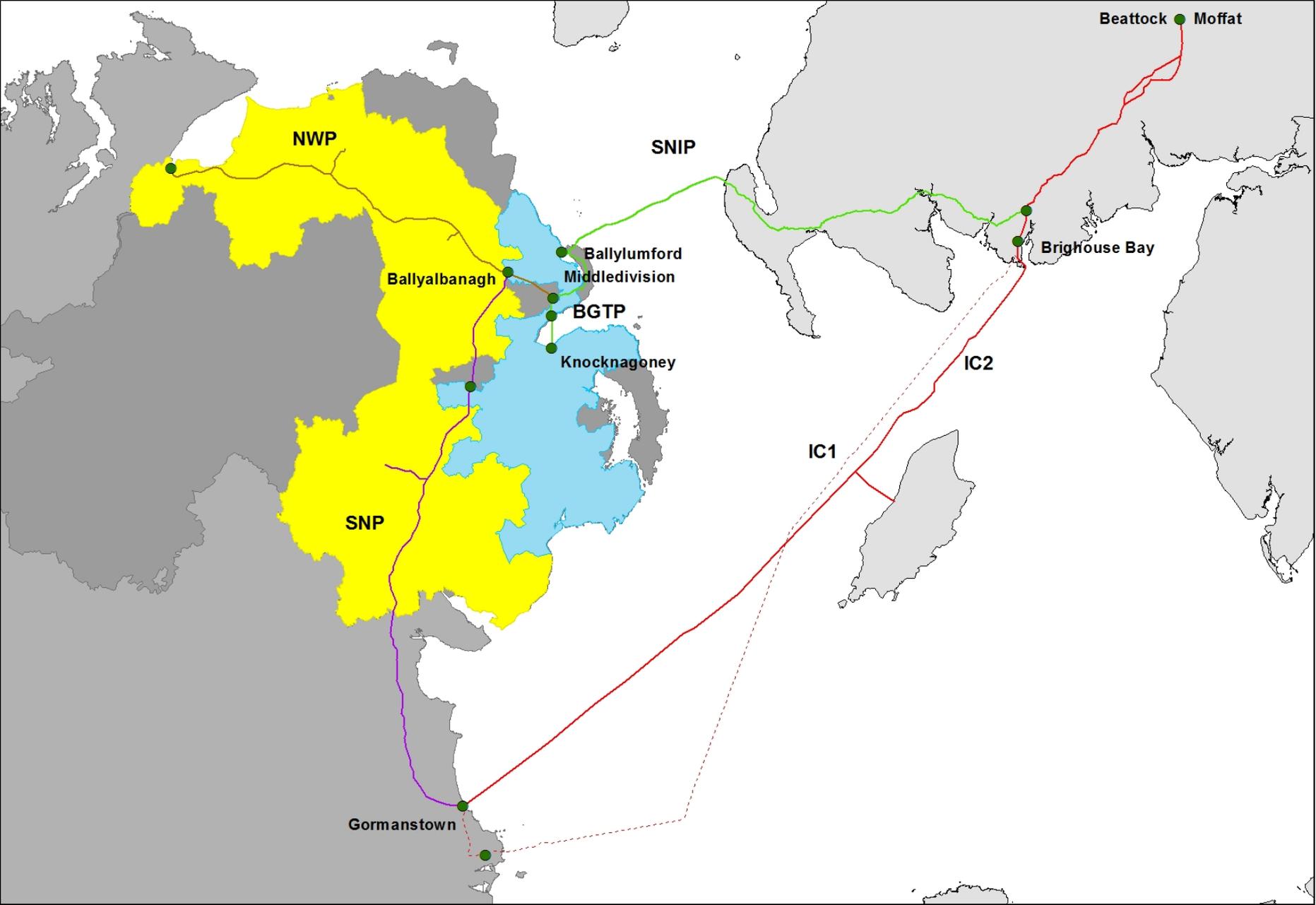
Northern Ireland Gas Network



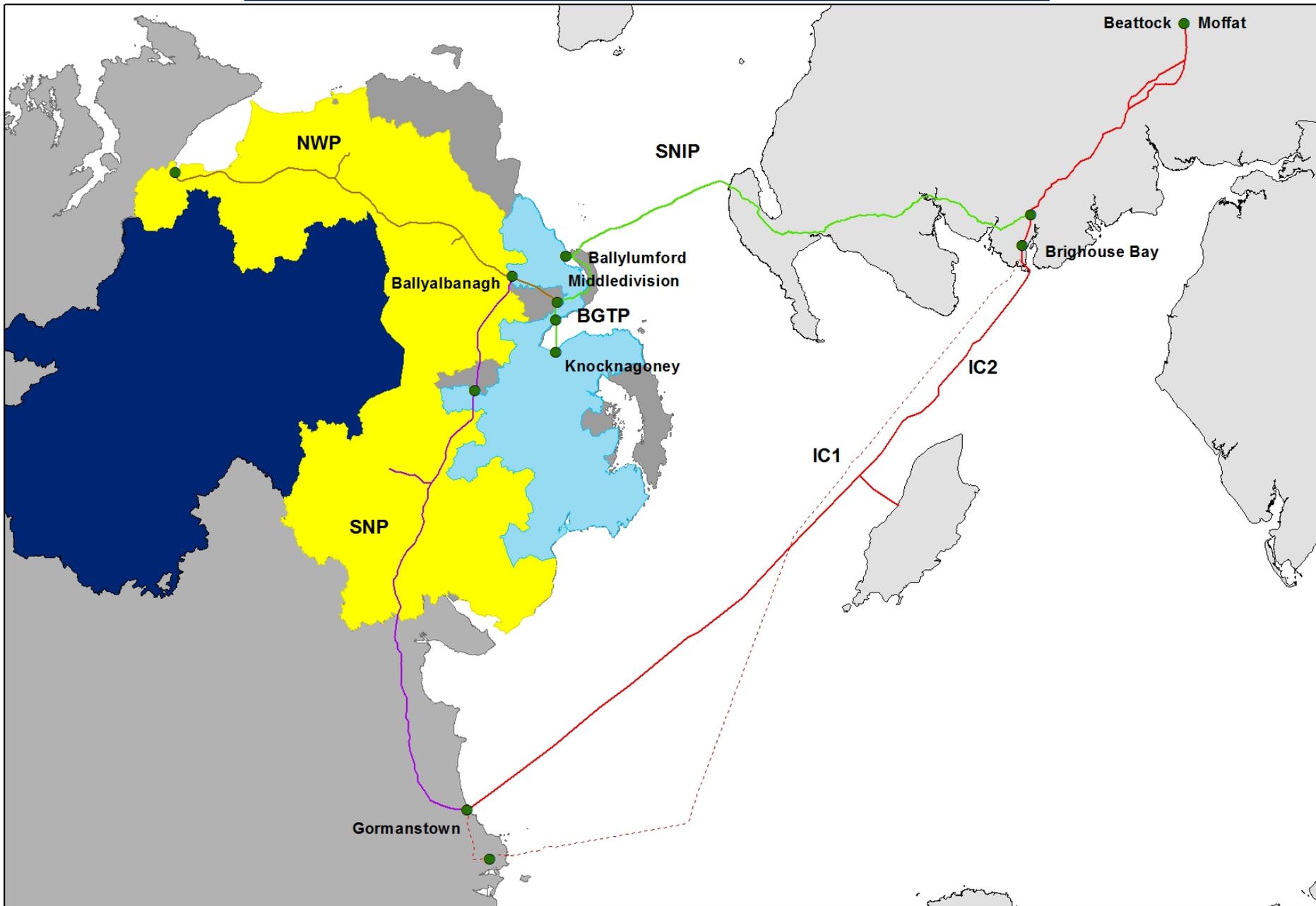
Northern Ireland Gas Network



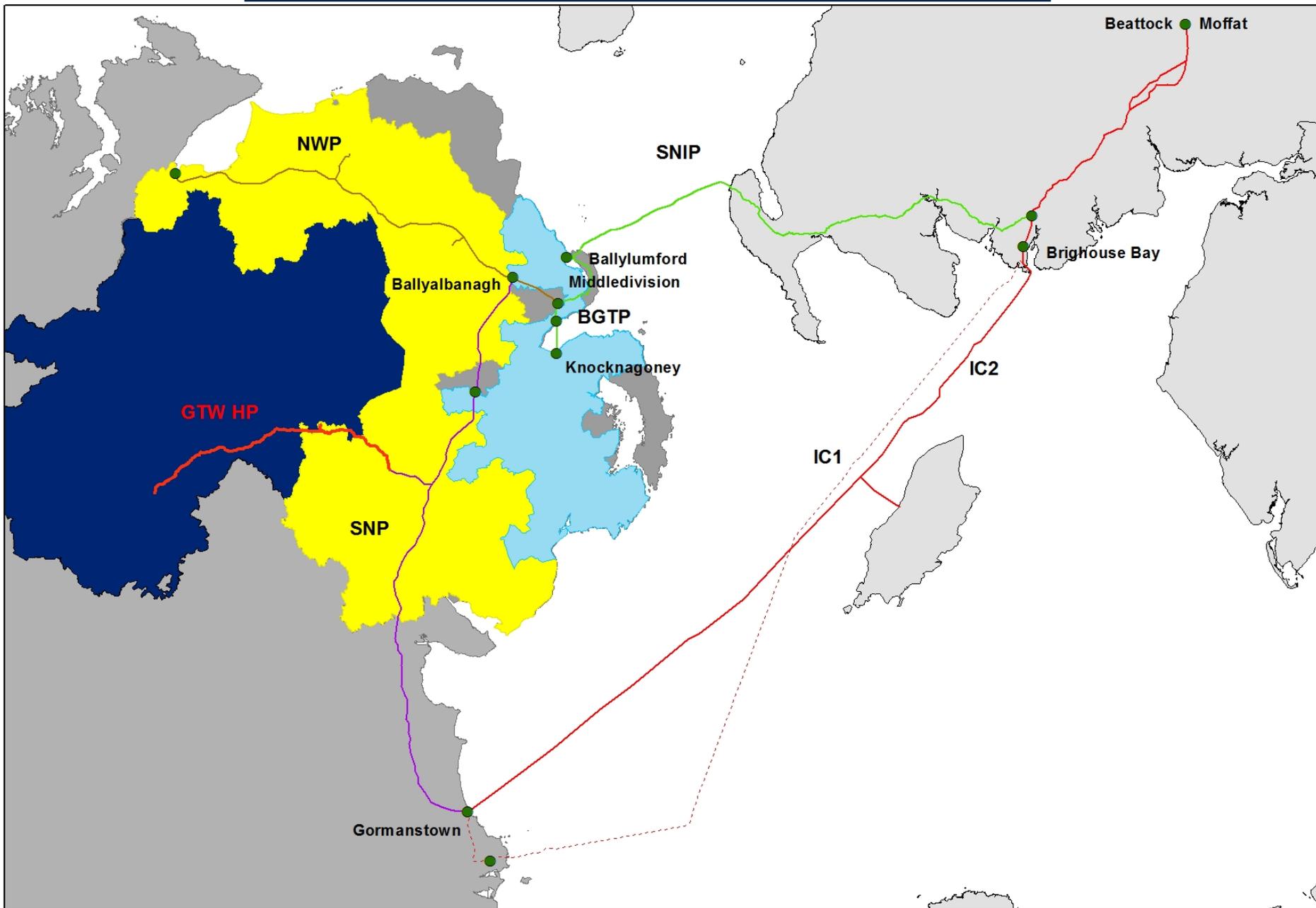
Northern Ireland Gas Network



Northern Ireland Gas Network

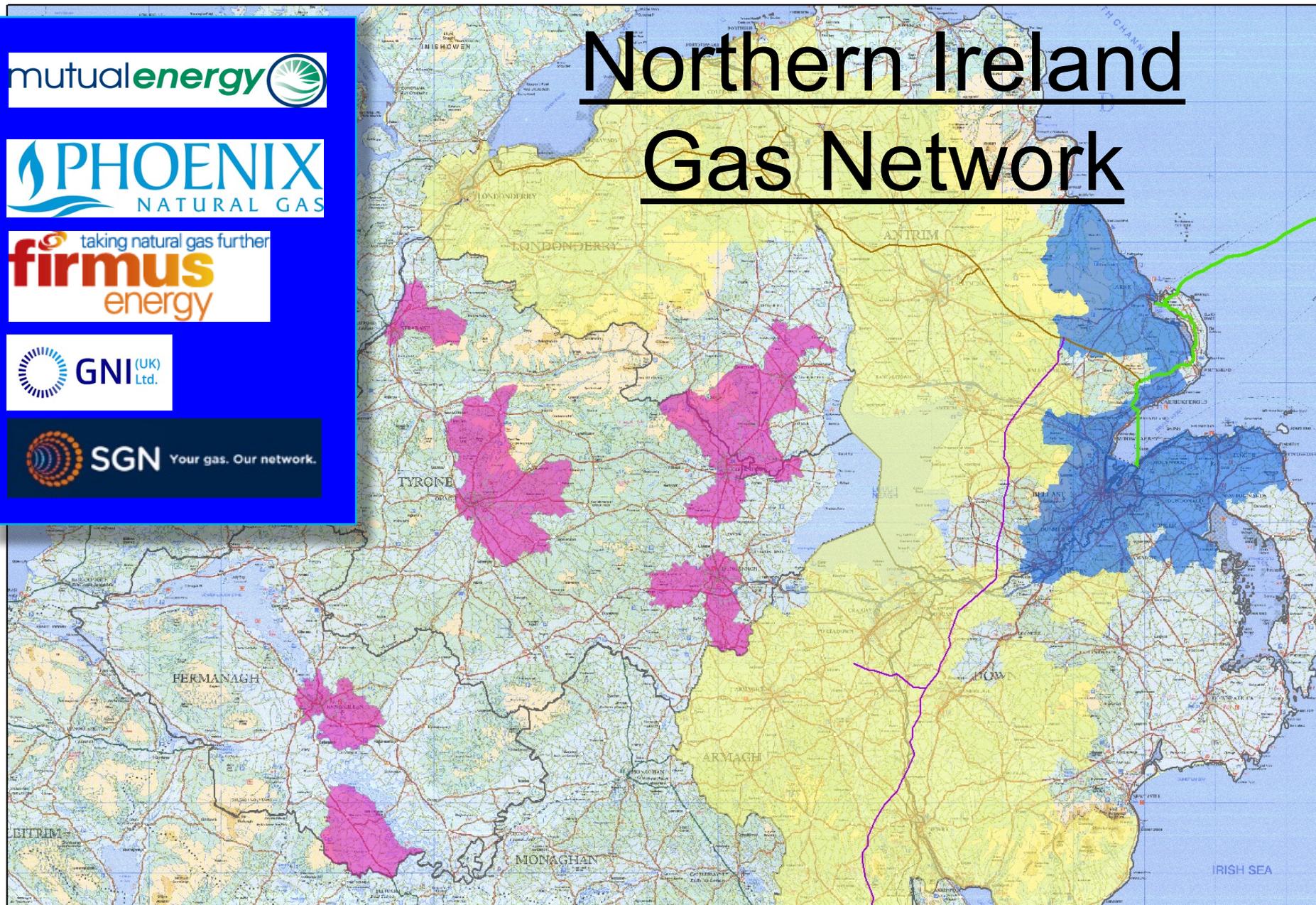


Northern Ireland Gas Network





Northern Ireland Gas Network





Strategic Importance for NI



Key elements/differences being a “Mutual”

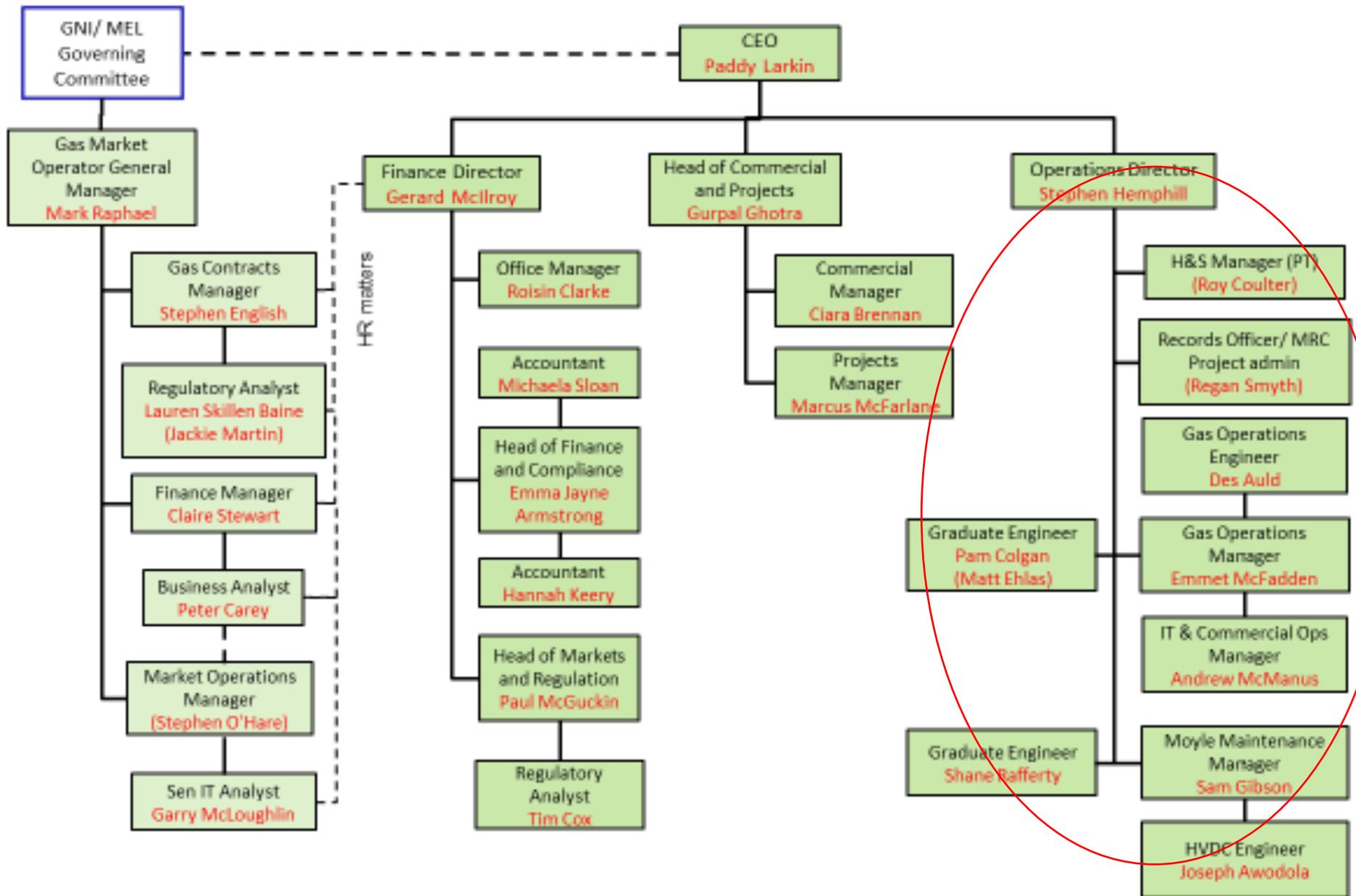
- Mutual Energy founded in 2001 with strong government and regulatory support to acquire the assets and run as a **mutual** utility companies
- Assets developed by the traditional vertically integrated utilities of the day
 - British Gas developed the Premier assets in early 90’s
 - Northern Ireland Electricity (NIE) developed Moyle in late 90’s

The key elements of the Mutual Utility are...

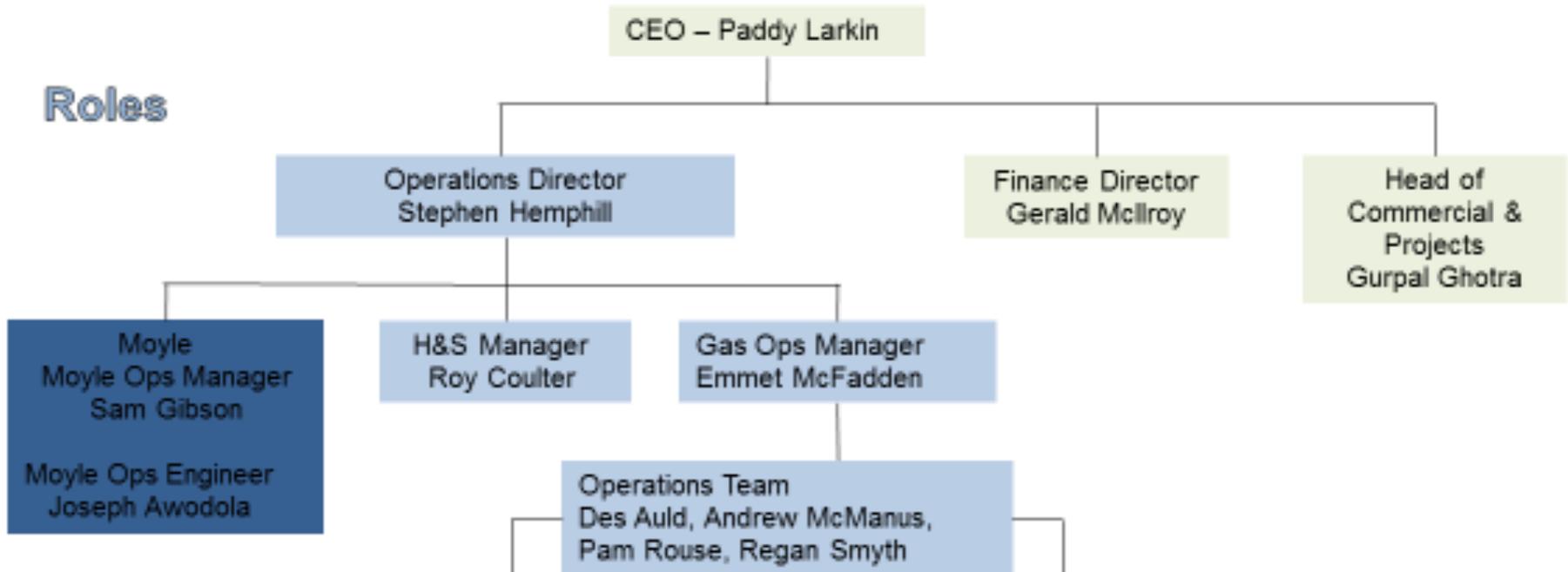
- Capital intensive, operationally stable and underpinned with secure revenue mechanisms
- Operational License which allows
 - full pass through of costs
 - All profits returned to the customer (tariff reductions)
- All of which facilitate finance 100% debt long term bonds typically 2.5% vs regulatory return of 8%

Which materialise in some key differences....

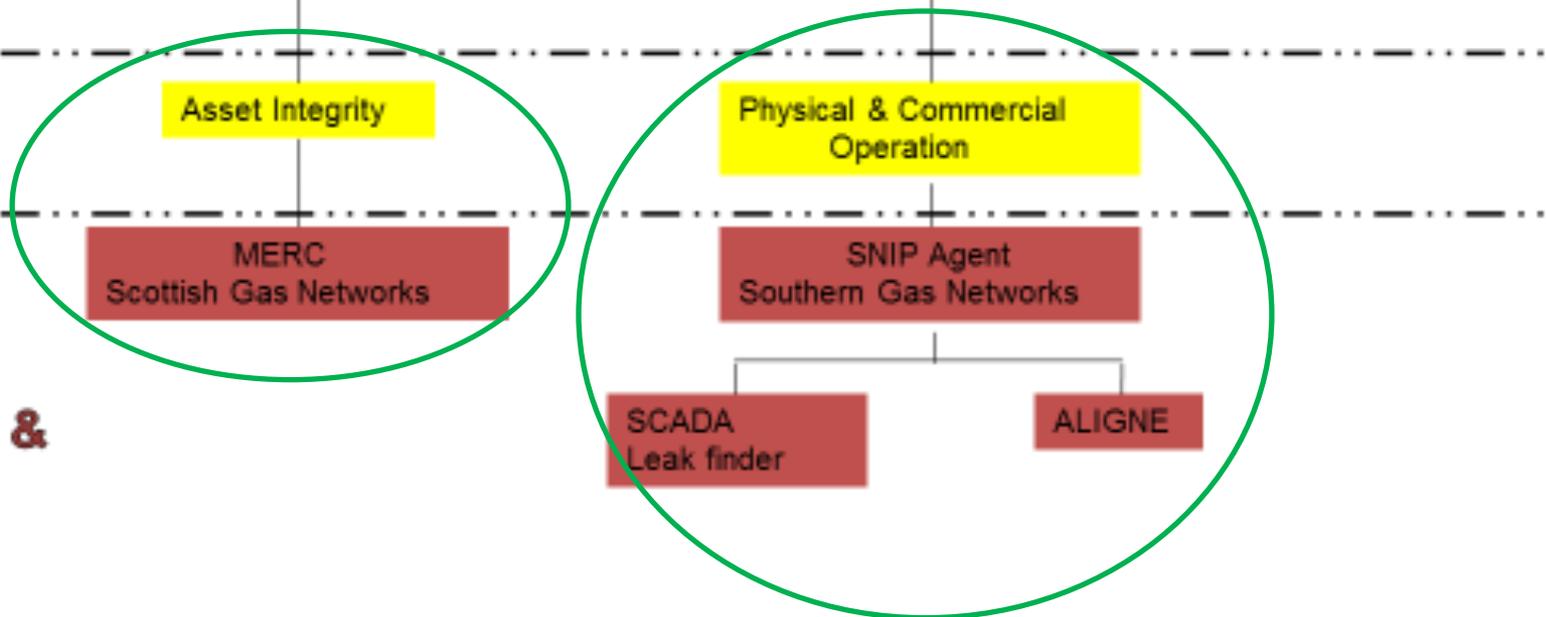
- Strong corporate governance
- Small dedicated management team
- Key contractual partnerships with larger system operators and the OEM’s
- High level of cost transparency and scrutiny from industry, media and government
- Stakeholder management very important



Roles

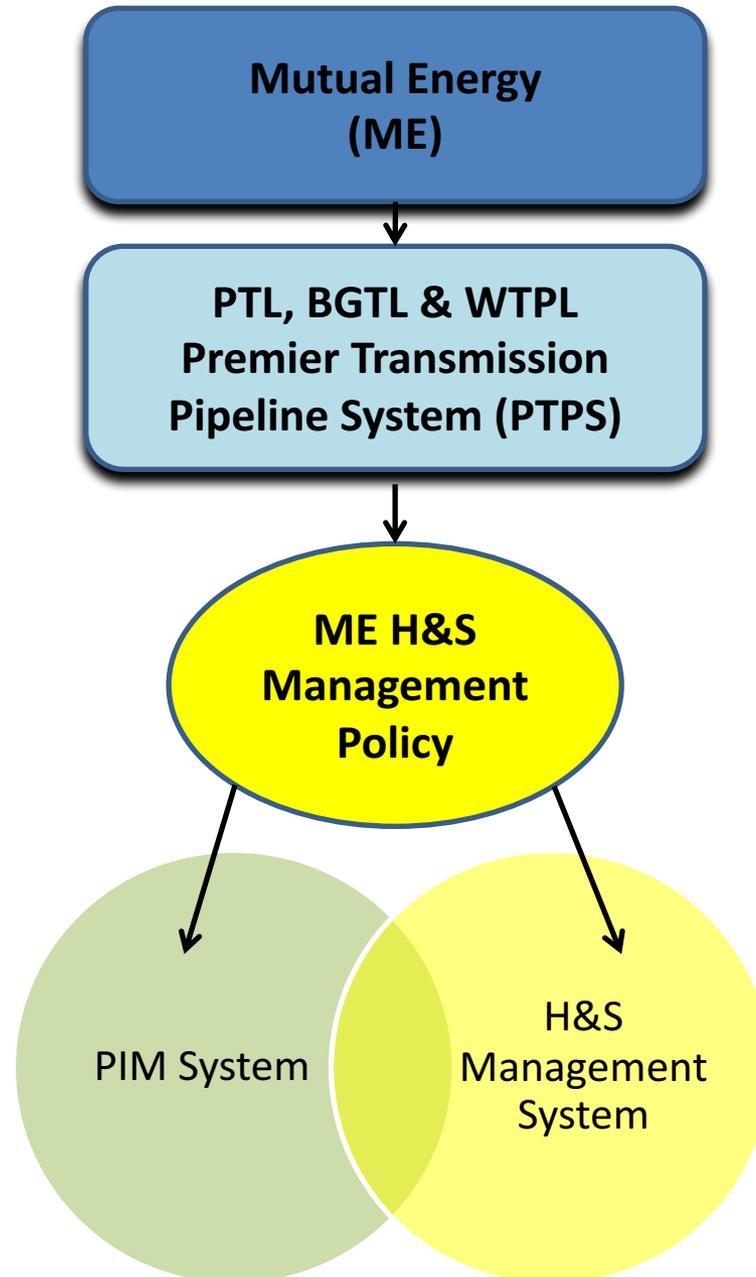


Functions



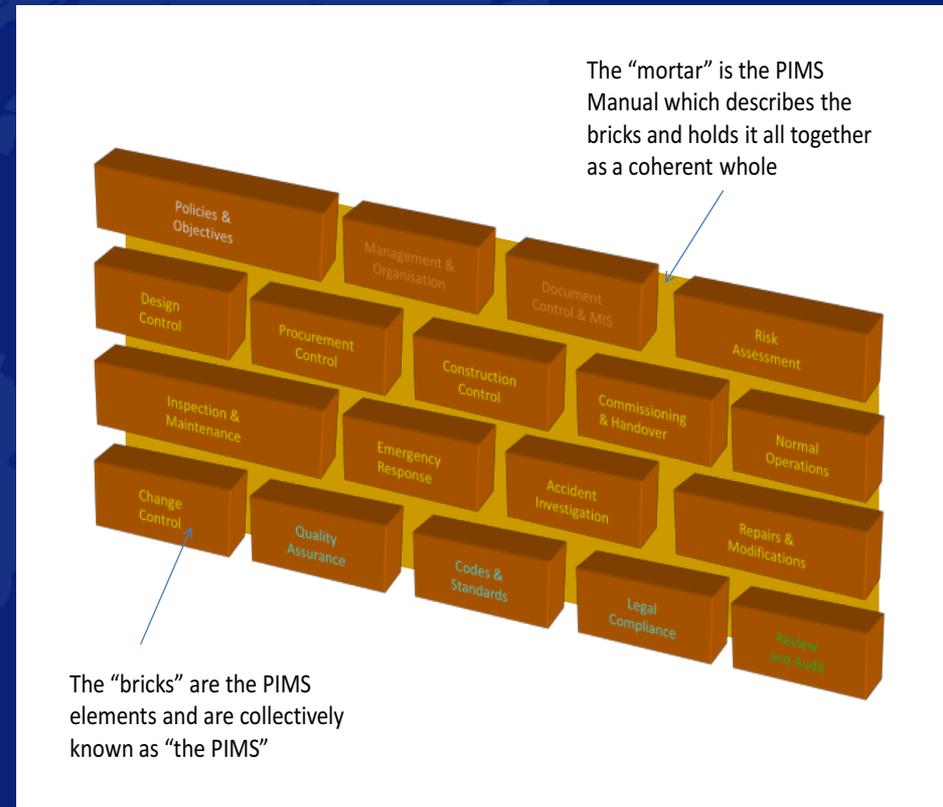
Contracts & Systems

How do we Manage Integrity & Operation?

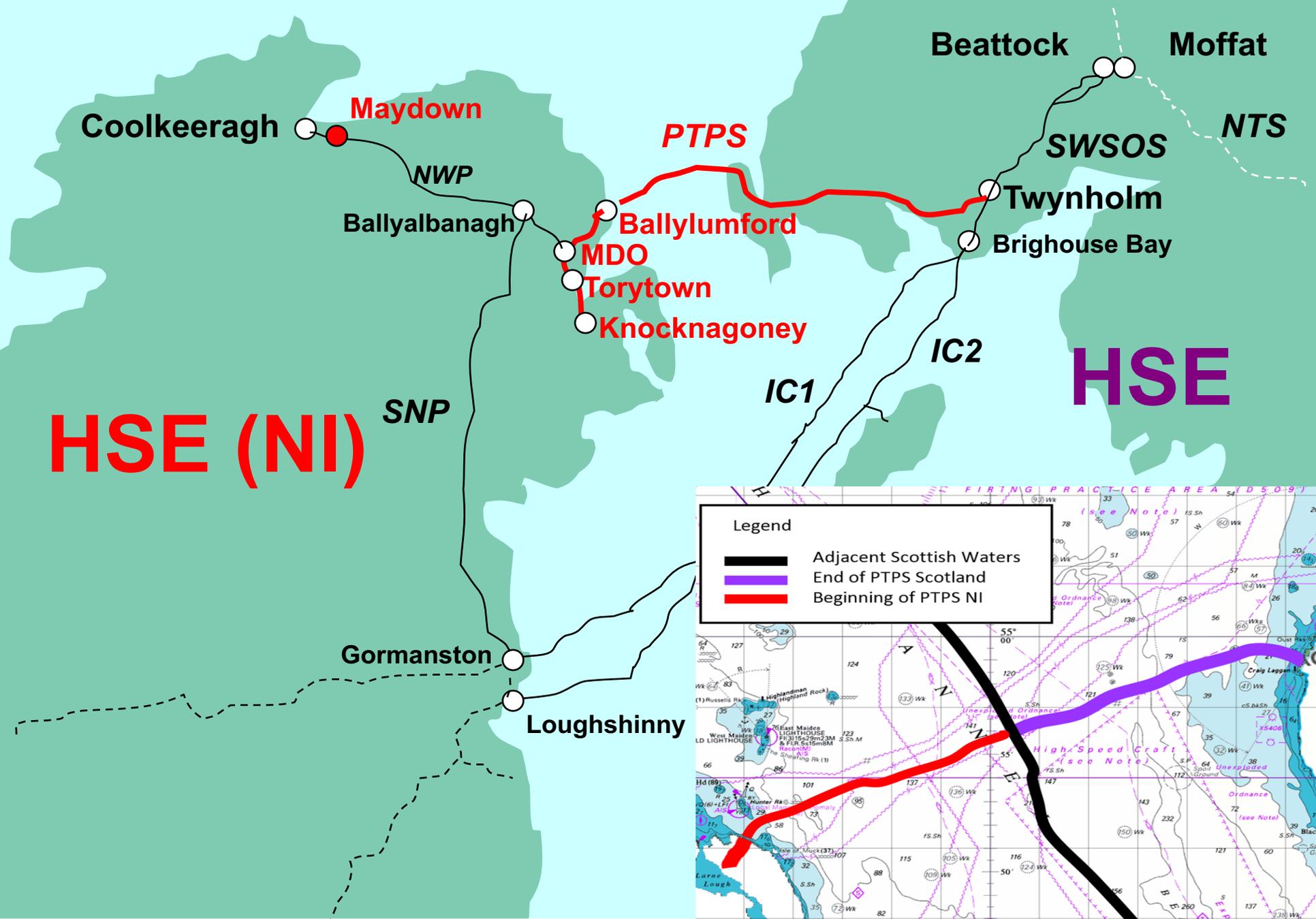


Pipeline Integrity Management System - Overview

- HSE Policy
 - HSMS & PIMS Objectives
- Pipeline description
- Organisation
- Risk Management
- Design and Construction
- Integrity Management
- Normal Operations
- Safe Control of Operations
- Emergency Response
- Incident, Investigation & Reporting
- Remedial Action Register
- Change Control
- Procurement
- Repairs
- Document Control
- Audit & Review



- **Based on the principles of HSG65 - Plan, Do, Check, Act**

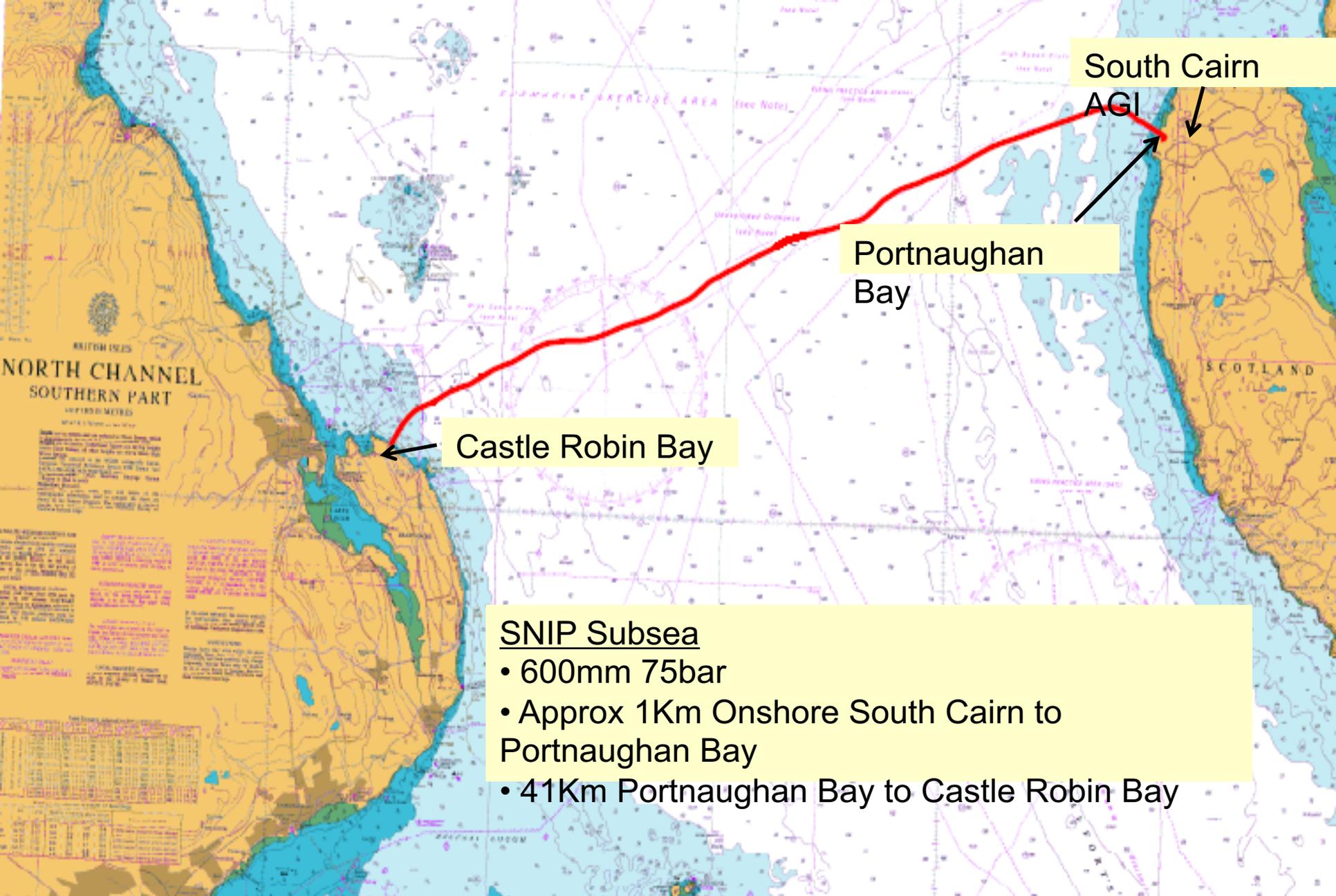


Premier Transmission Pipeline System PTPS

SNIP Onshore Scotland

- 600mm 75bar
- 89Km Twynholm to South Cairn
- Twynholm Offtake
- 4 BVs including Stranraer Offtake
 - BV1 – BV3 – no site power or telemetry
- South Cairn AGI (PIG Trap)





South Cairn

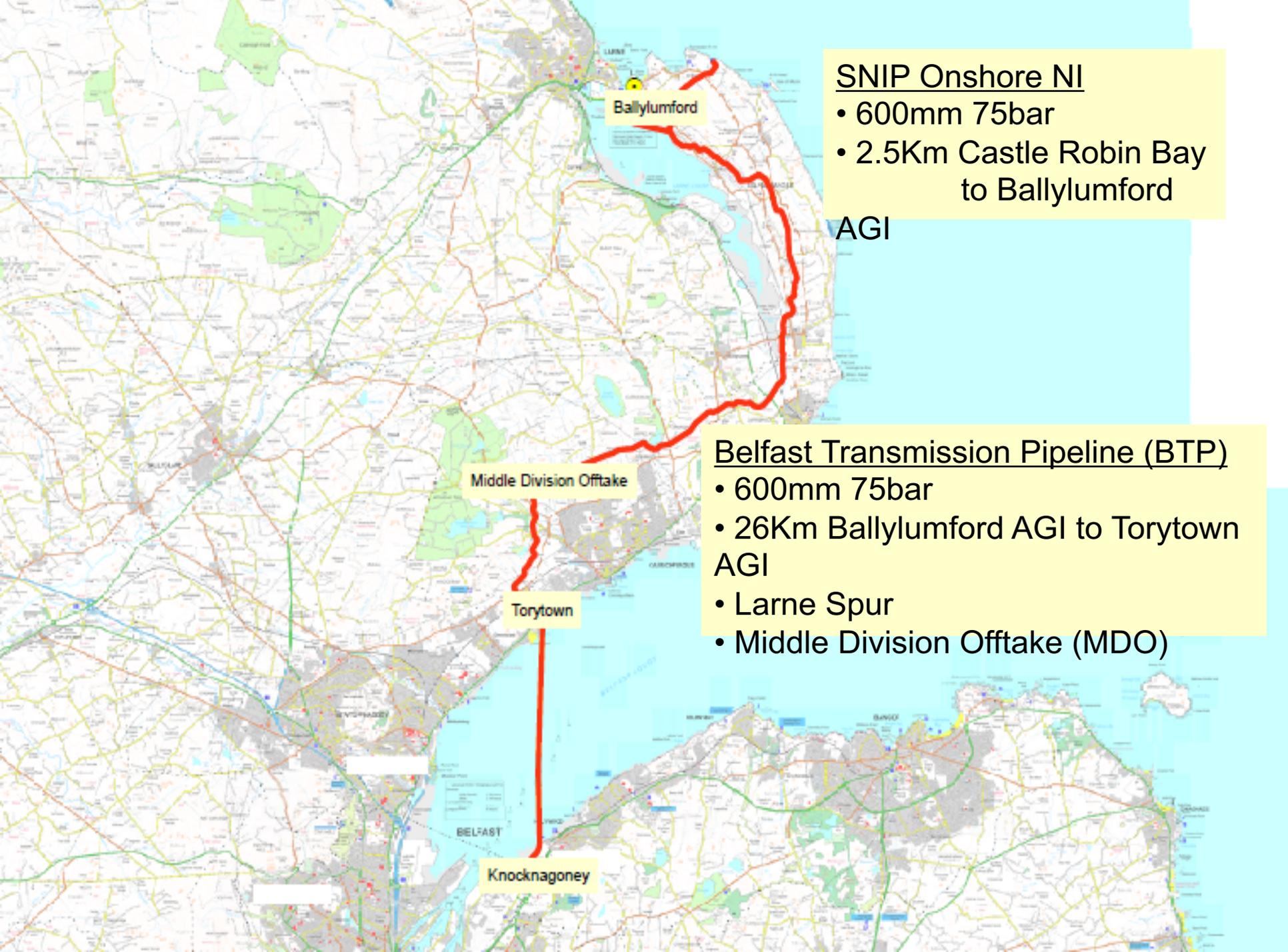
AGI

Portnaughan Bay

Castle Robin Bay

SNIP Subsea

- 600mm 75bar
- Approx 1Km Onshore South Cairn to Portnaughan Bay
- 41Km Portnaughan Bay to Castle Robin Bay



SNIP Onshore NI

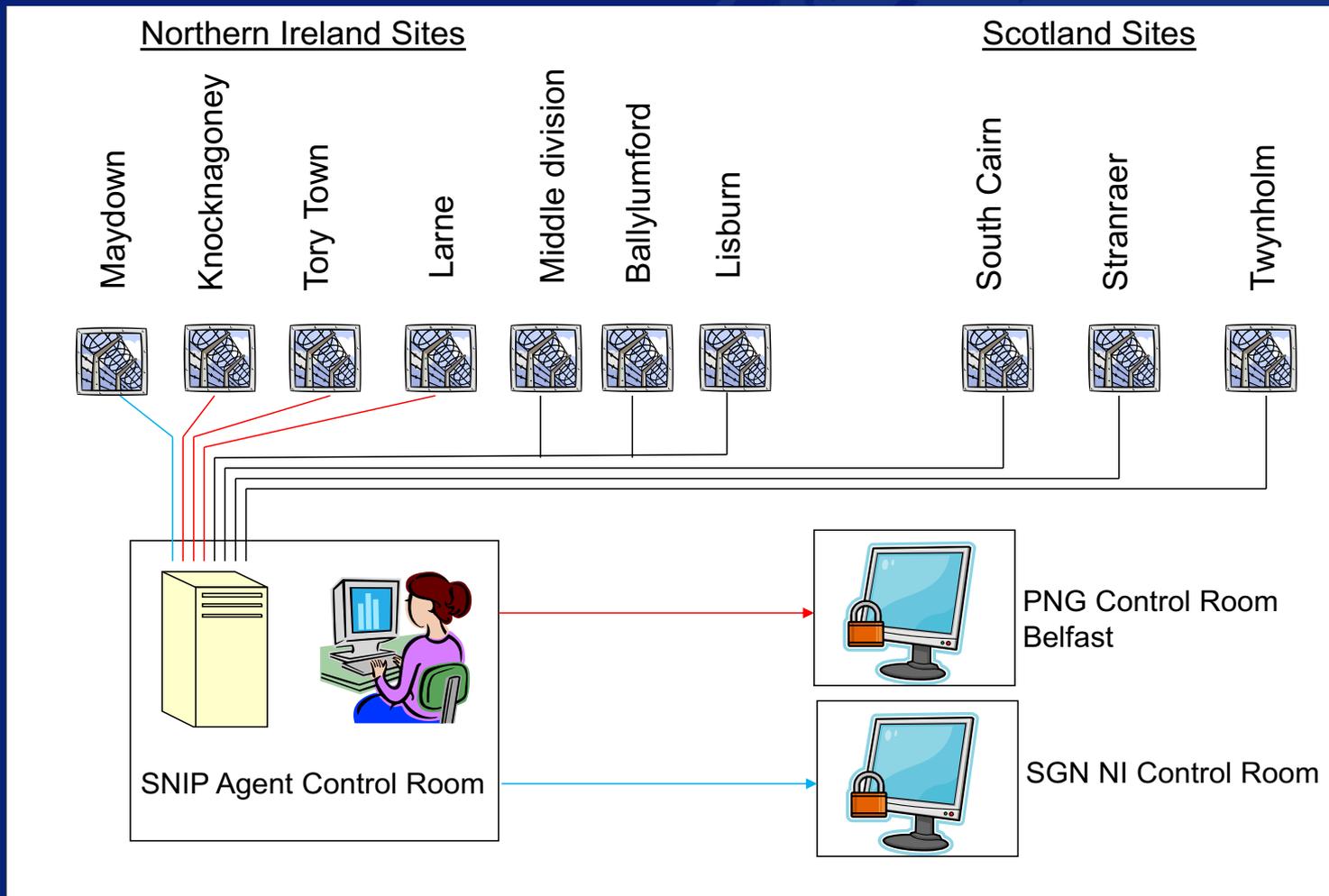
- 600mm 75bar
- 2.5Km Castle Robin Bay to Ballylumford

AGI

Belfast Transmission Pipeline (BTP)

- 600mm 75bar
- 26Km Ballylumford AGI to Torytown AGI
- Larne Spur
- Middle Division Offtake (MDO)

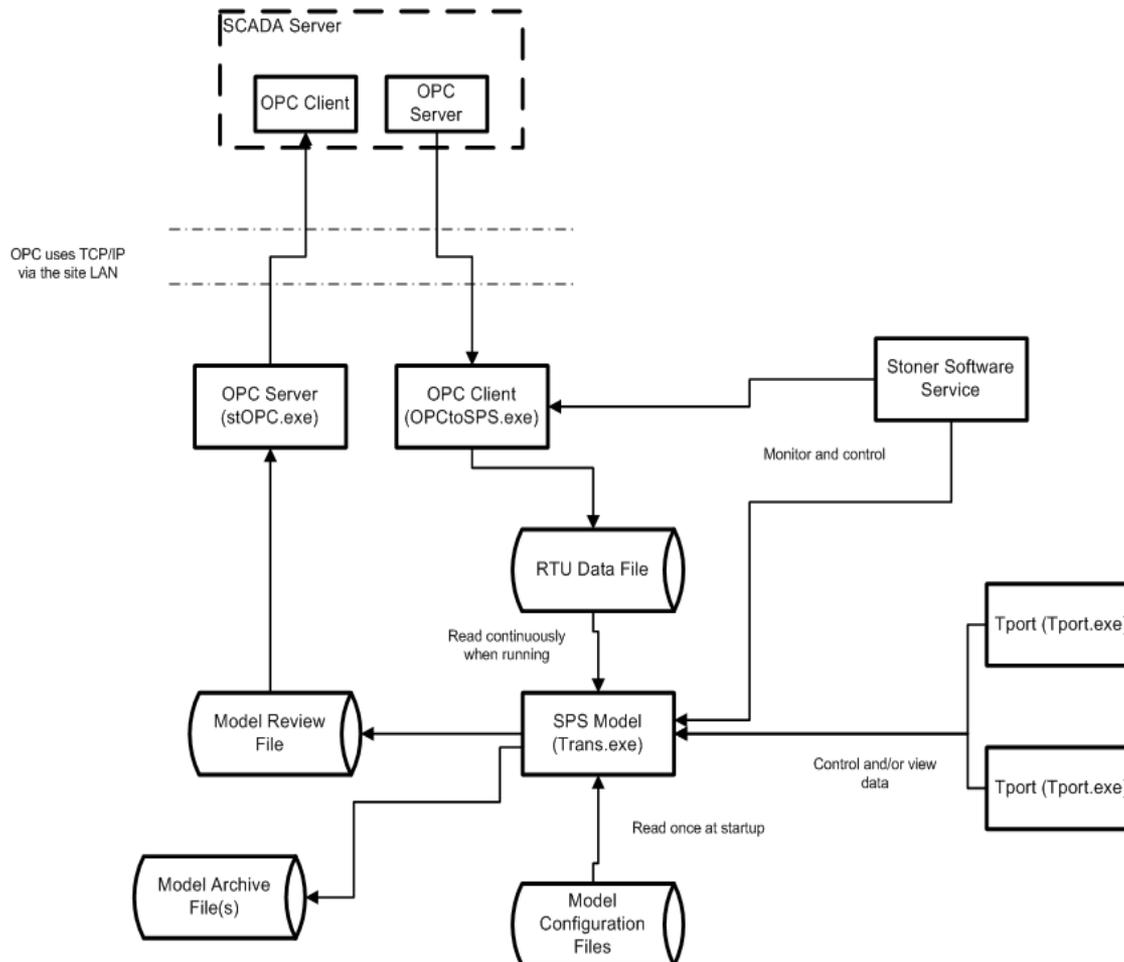
System Description - Scada System



THE PTL SCADA SYSTEM

System Description - Leakfinder System

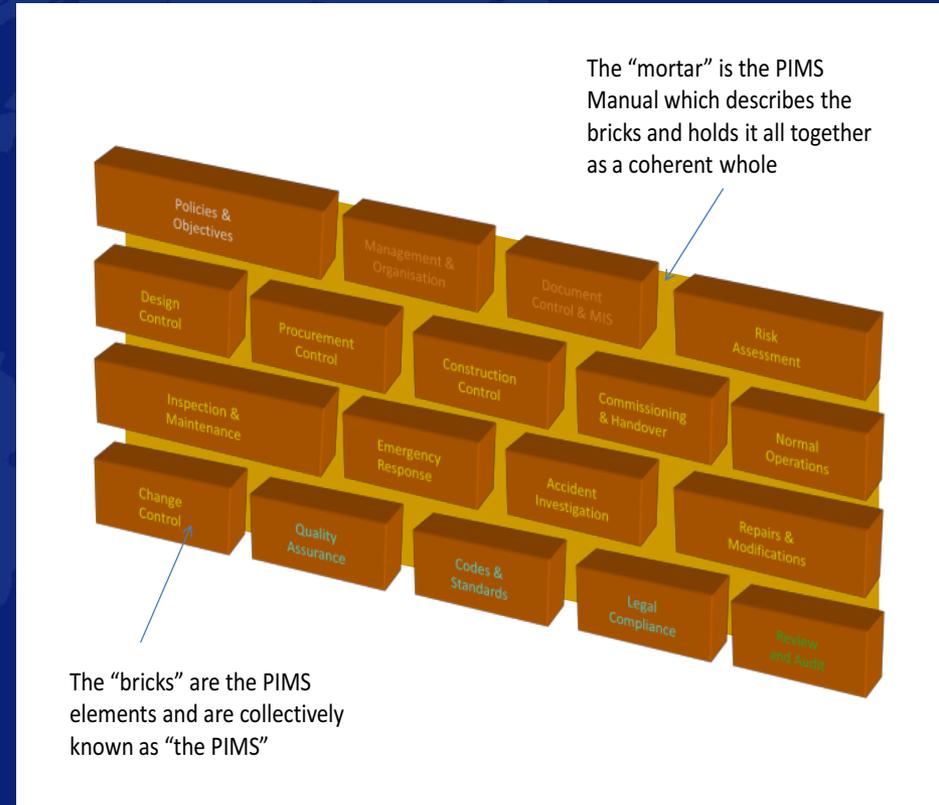
Overview of SPS processes



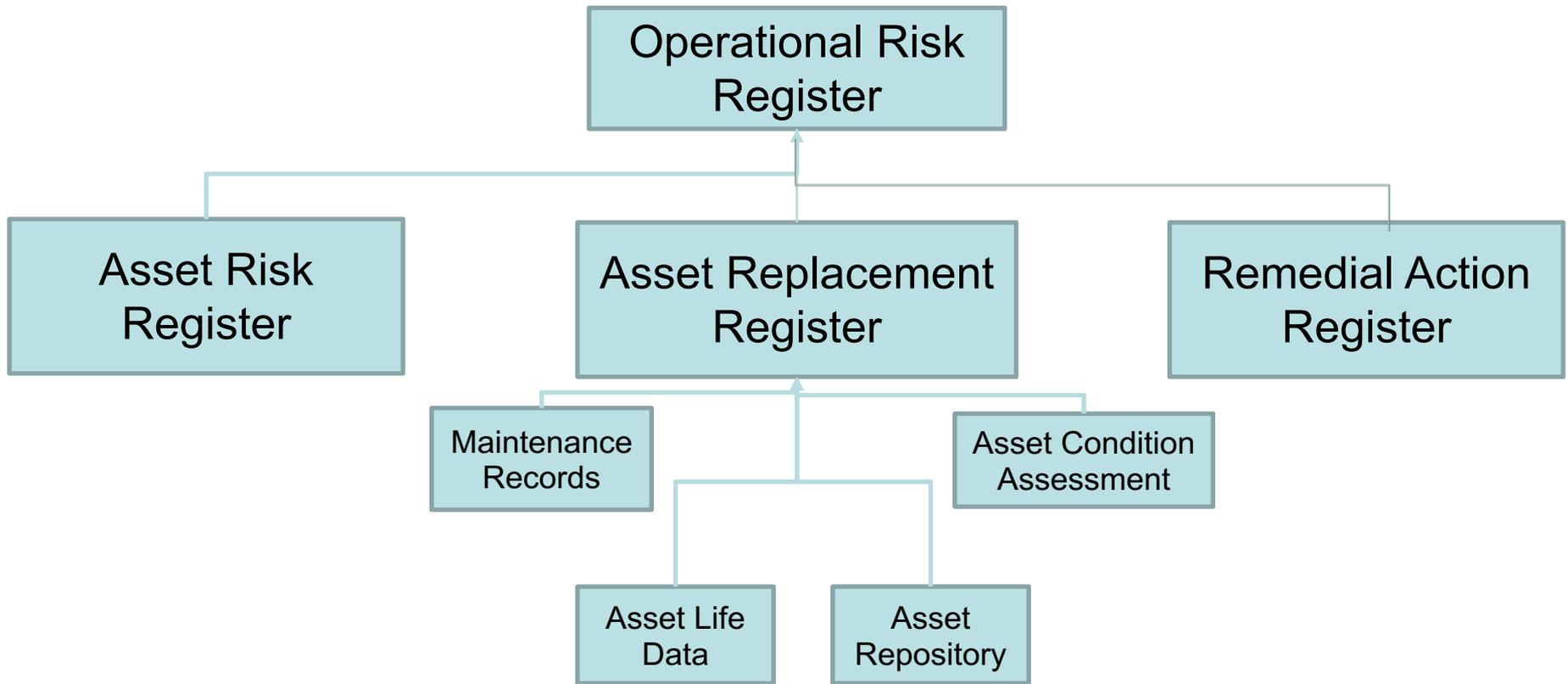
- Leakfinder
 - Independently calculates pressures and temperatures at specific points
 - Compares against SCADA values
 - If calculated value compared with actual is outside tolerance over set time periods, alarm raised

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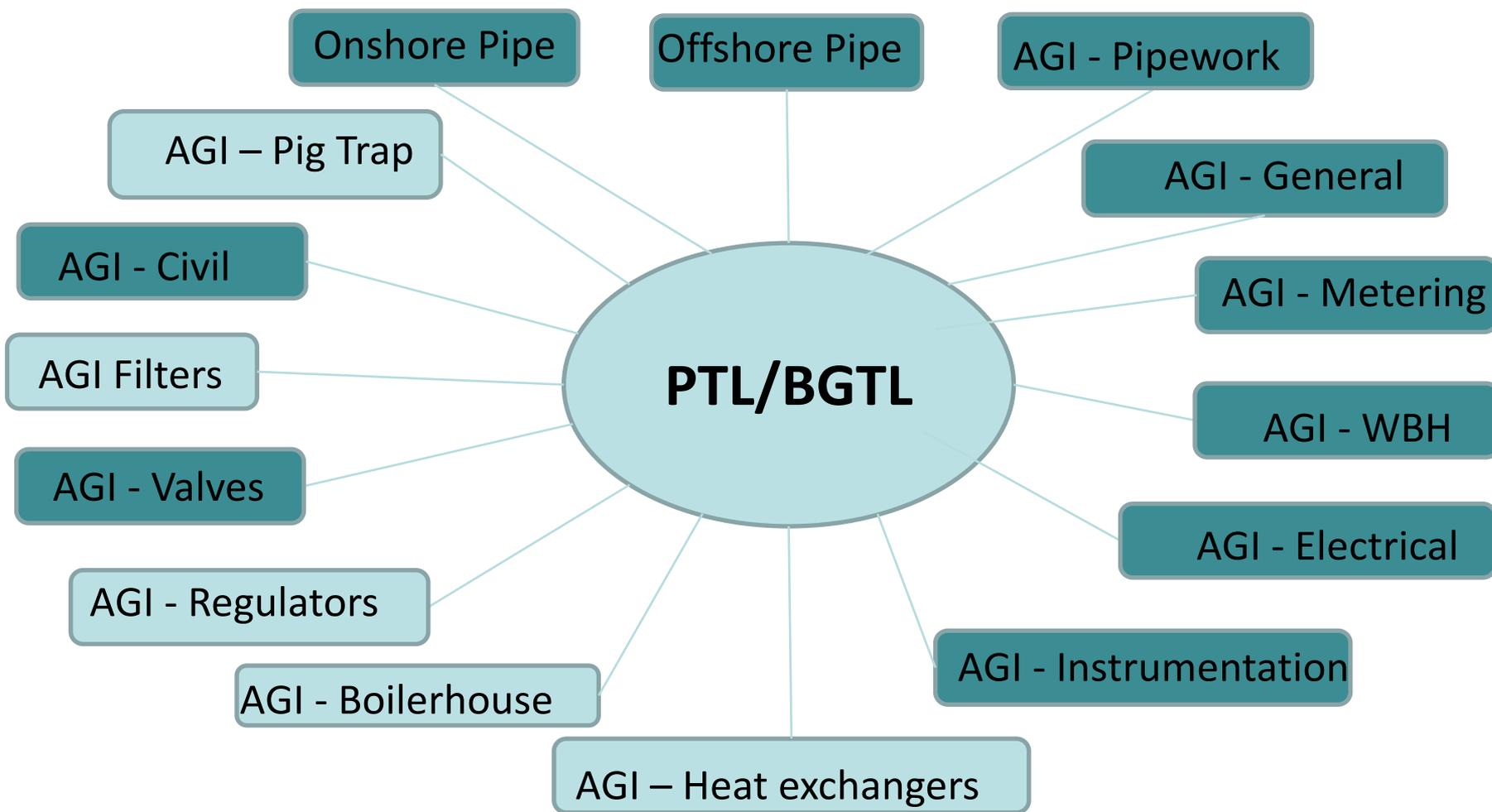
Risk Management



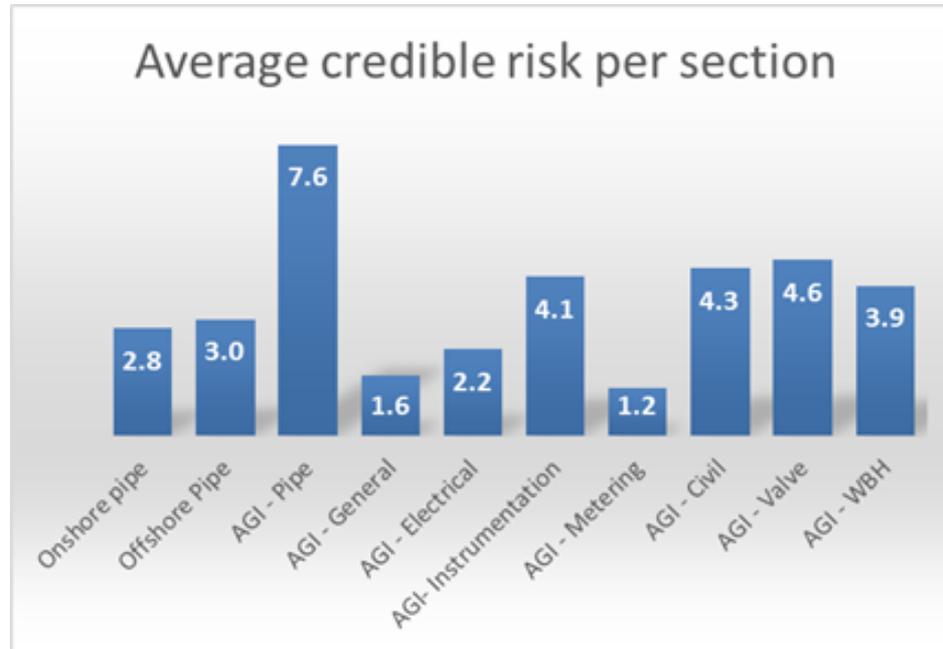
Remedial Action Register

Month	Lagging Actions			Leading Actions (Surveillance, Planned Maintenance, Risk Review, Sit & Work Inspections)			Other To Do	Summary		
	(Near Miss and Good Catch Incident Reports)			Low	Med	High		New in month	Complete in month	Moith End Total
	Low (1-3)	Med (4-8)	High (9-16)	Low (1-3)	Med (4-8)	High (9-16)				
June-16	5	4	0	13	12	0	71	2	18	105
July-16	5	3	0	13	12	0	70	0	2	103
Aug-16	6	3	0	13	12	0	77	11	3	111
Sept 16	5	4	0	13	12	0	66	5	18	100
Oct 16	5	5	0	13	12	0	66	1	0	101
Nov 16	4	5	0	12	12	0	77	11	2	110
Dec 16	4	5	0	12	12	0	76	0	1	109
Jan 17	4	4	0	11	14	0	74	3	3	109
Feb 17	4	4	3	11	14	0	74	3	3	112
Mar 17	4	5	3	11	14	0	74	3	3	115
April 17	3	8	2	10	15	0	80	3	3	118
May 17	2	10	1	8	16	0	84	4	1	121

Asset Risk Register - 15 High Level Asset Parts



Average Risk Score per Asset Area

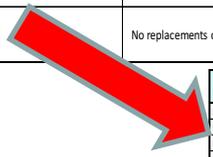


Section	Number of credible risks per section	High risks (12-16)	Medium risks (9-8)	Lower risks (6)	Low risks (1-4)	Average credible risk per section
Onshore pipe	25	0	2	4	19	2.8
Offshore Pipe	27	0	3	2	22	3.0
AGI - Pipe	68	2	15	5	46	7.6
AGI - General	14	0	5	2	7	1.6
AGI - Electrical	20	2	1	1	16	2.2
AGI- Instrumentation	37	1	3	4	29	4.1
AGI - Metering	11	0	0	0	11	1.2
AGI - Civil	39	4	3	3	29	4.3
AGI - Valve	41	2	4	0	35	4.6
AGI - WBH	35	2	11	5	17	3.9

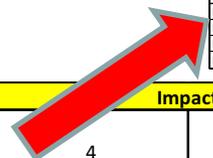
Asset Replacement Model

Likelihood of Failure	Replacement Drivers			
	Operations	Manufacturer Support	Replacement Component Status (like for like)	Spares Holding
	1	Complete records confirming good operating history with no failure	Active product support available with no planned end date	Active products available with no planned end date
2	Electrical Component expected life 10 years, failure rate of less than 3 occurrences / 10 years	Active product support available with at least 4 years support	Active product available for purchase for at least 4 years	100% of Component Quantity and not tested
3	Electrical Component expected life 10 years, failure rate between 3-7 occurrences / 10 years	Active product support available with at least 2 year support	Active product available for purchase for at least 2 years	1 Component Unit available and regularly tested up to 100%
4	Electrical Component expected life 10 years, failure rate greater than 7 occurrences / 10 years	Discontinued Support	Replacements no longer available but may be repair services	1 Component Unit available but not tested, up to 100%
5	Component has failed and needs to be replaced		No replacements or repair options	None

Likelihood of Failure LOF Scoring Methodology (Increasing Likelihood from 1-25)



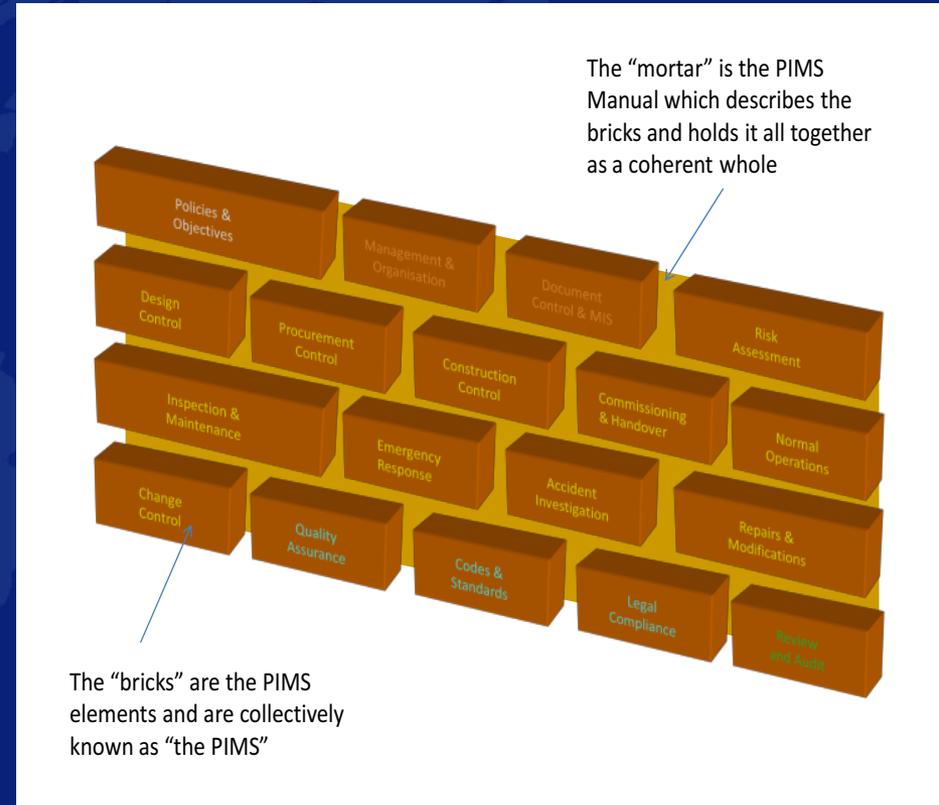
Asset Risk Matrix Score	LOF	COF	Score	Percentage of highest possible score
PLC (processor and back up comms modules and PSU)	4	3	12	60
PLC I/O Cards incl PSU	4	3	12	60
PLC Flow Computer Comms	3	2	6	30
Flow Computer - Processor	3	2	6	30
Flow Computer - ADC	2	2	4	20
KF2	3	2	6	30
24V Power Supply	5	3	15	75
Distribution Board	1	2	2	10
Gas Chromatograph	3	2	6	30
Gas Chromatograph Controller	3	2	6	30
Eurotherm Temp Controller	3	2	6	30
Fibre optic Comms Modules	3	1	3	15
Panelviews	3	1	3	15
Isolators/barriers	5	2	10	50
Relays for meter control	2	2	4	20
Panel Cabinet	1	3	3	15



Consequence of Failure COF Scoring Methodology	Impact		H&S	Asset Integrity	Gas Supply	Commercial
	4	High	Death, multiple injuries, suspension notice	Pipeline rupture/ significant leak	Likely to lead to direct loss of gas supply to all or part of the network	>£10M, 3% I.a.
	3	Medium	Serious injury, improvement notice	Major asset damage if not resolved in the short term likely to lead to a leak/rupture	If left unresolved in the short term could lead to loss of gas supply	>£1M, 0.5% I.a.
	2	Low	Minor injury, monitoring notice	Asset damage if not resolved in the medium term likely to lead to a leak/rupture or actual minor leak	If left unresolved in the medium term will lead to loss of gas supply/affect asset integrity	£0.1-£1M p.a., 0.1% I.a.
	1	Minor	Hazardous condition	Unlikely to cause a leak or rupture	Unlikely to cause a gas supply issue	< £0.1M p.a., <0.1% I.a.

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Pipeline Integrity Management System - SIMM

S - Surveillance

I - Inspection

M - Maintenance

M - Monitoring

SIMM – Inspection & Maintenance

Corrosion Mitigation

- Proactive Removal of lagging
 - Torytown Heating Pipework replacement
- Wind water line inspection & remedial works Northern Ireland AGIs



SIMM – Inspection & Maintenance

Corrosion Mitigation

- Wind water line inspection & remedial works Northern Ireland AGIs
 - Torytown Heat exchanger outlet pipework
 - Ballylumford WBH Outlet p/w



Monitoring & Surveillance

- Subsea Pipeline Marker Posts and Aerial Markers



SIMM – Inspection & Maintenance Marine Survey Review



- Offshore & Nearshore Vessels



MAPD Risk Mitigation

- Corrosion
- Impact Damage
- External Fatigue - Spans

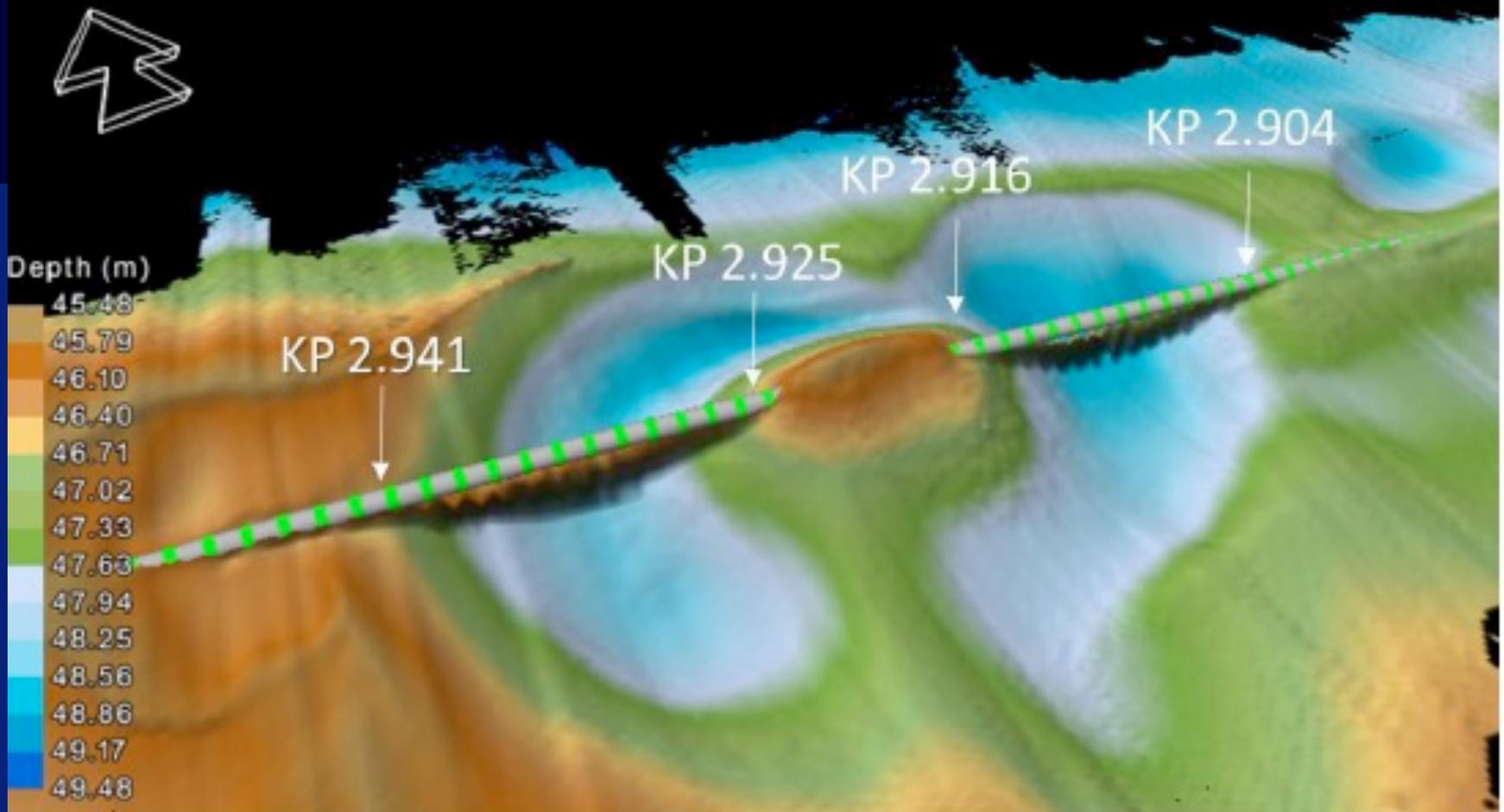
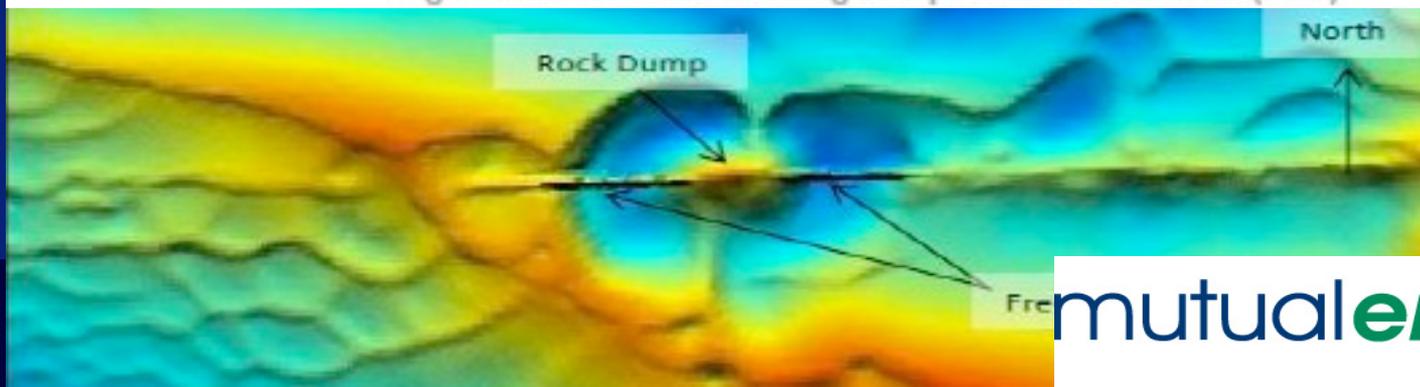


Figure 3-2: MBES data showing freespans around KP 2.920 (2016)



Marine Survey Review

Damage



Pipeline Damage Category	2016	2012
Type 1 – Tensile Construction Damage	36	57
Type 2 – Compressive Construction Damage	21	32
Type 3 – Concrete Coating Damage from Trawl Board or Anchor	1	28
Type 4 – FBE Coating Visible – Damage from Trawl Board or Anchor	0	0
Type 5 – Pipeline Steel Surface Exposed	0	0
TOTAL	58	117

Emergency Procedures

- **Internal**
 - **PTL/OP/004 Emergency procedures Manual for the Premier Transmission Pipeline System (PTPS)**
 - **SGN procedure T/PM/EM/76**
- **External**
 - **Dumfries & Galloway Major Emergency Scheme**
 - **PTPS offsite Emergency Plan**

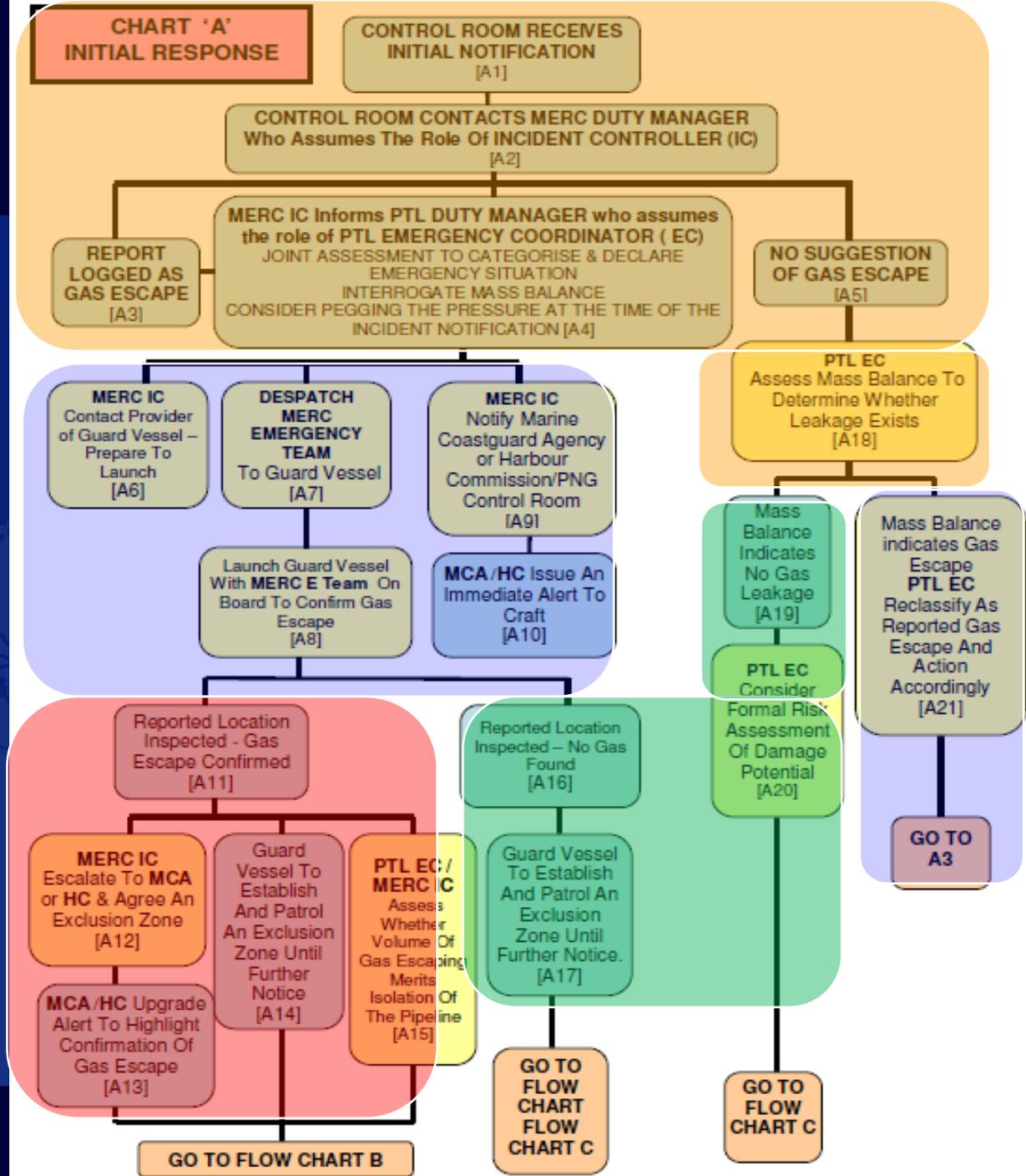
Emergency Procedures – PTL/OP/004

Emergency Definition
Incident
Gas Supply Emergency

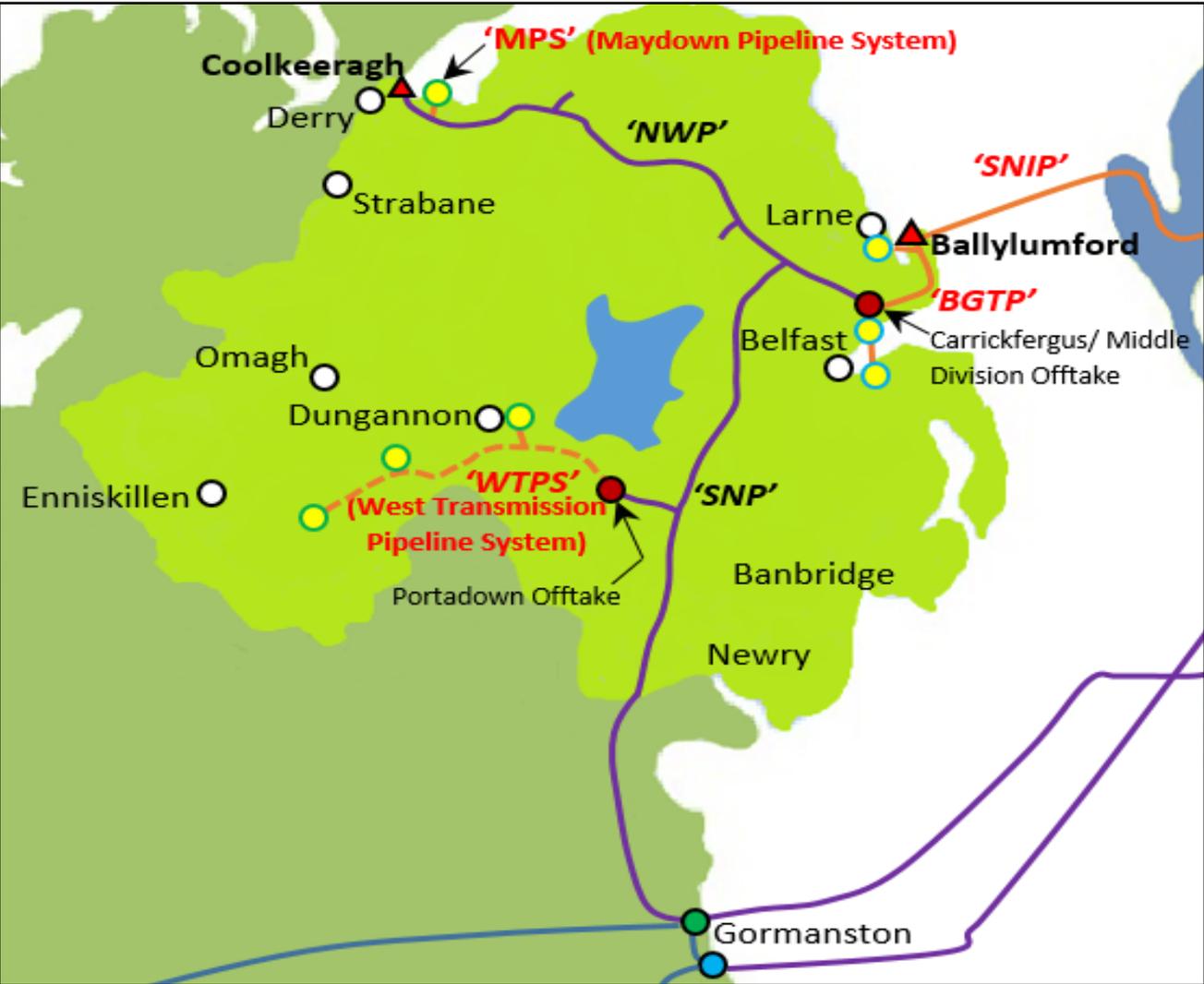


Management of an Offshore Incident – Initial Response

- SA Notification and classification of Incident with MERC IC
- SA Assessment of Leakfinder
- PTL EC and MERC IC dispatch guard vessel and notify MCA
- Escape confirmed,
- Guard Vessel Patrol,
- Exclusion zone confirmed to MCA by MERC IC
- PTL EC/MERC IC Consider Isolation
- No escape
- PTL EC arrange RA of damage potential



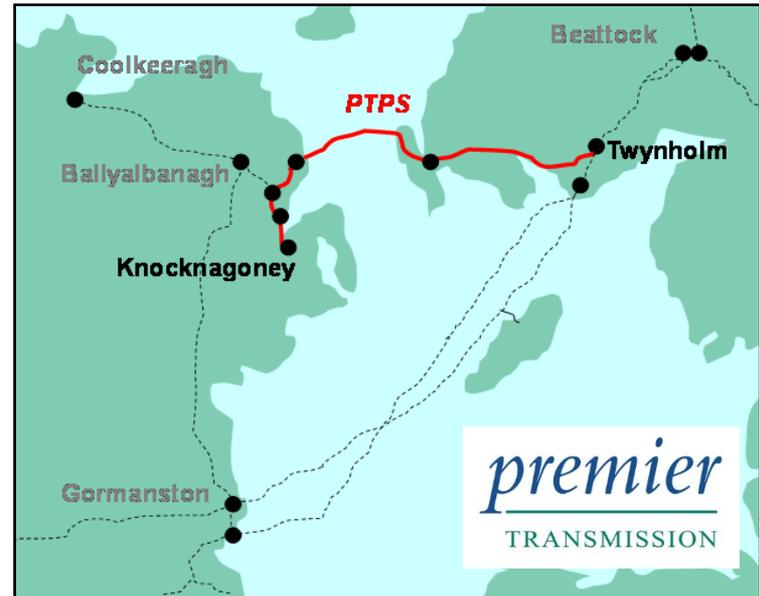
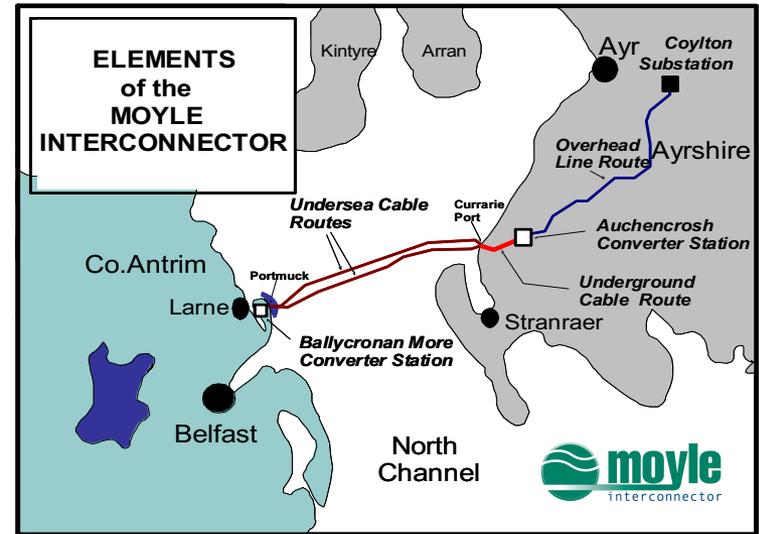
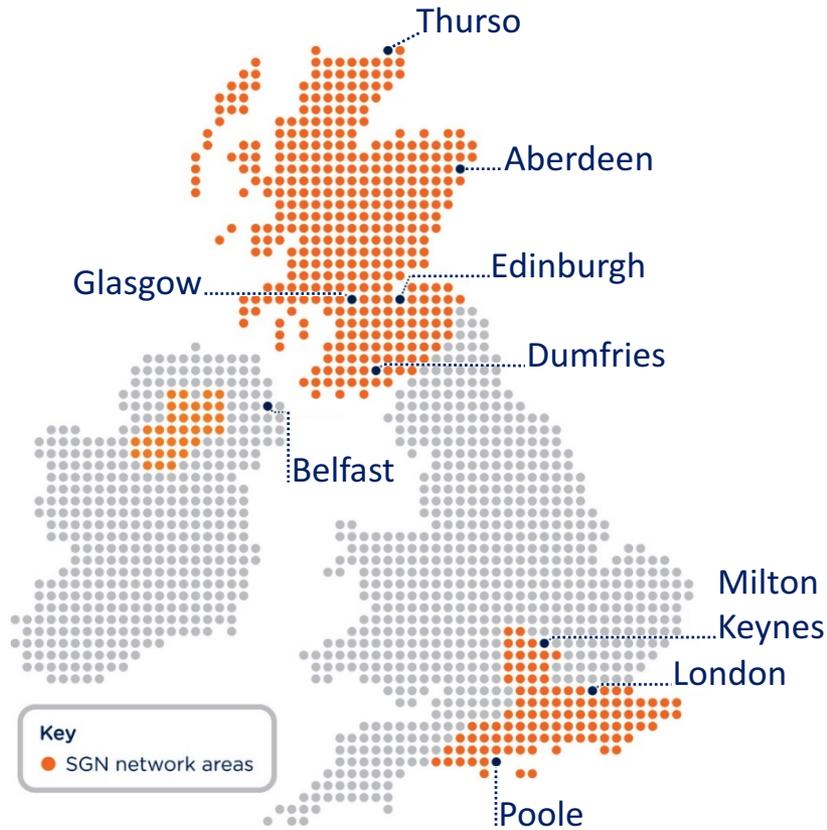
Gas To The West



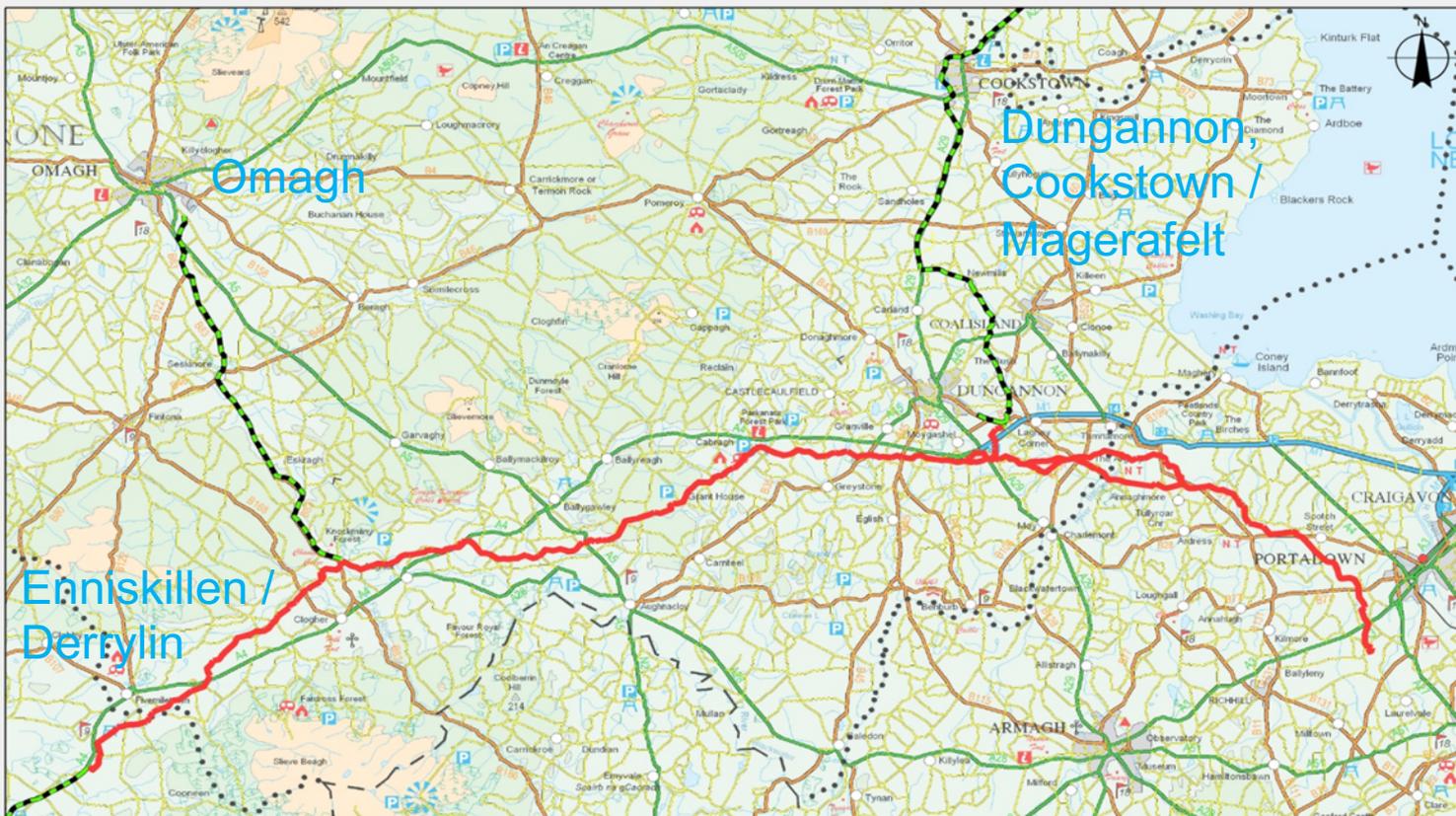
A Northern Ireland company working for consumers



Project Partners



West Transmission Pipeline



Legend
Type
— 12th Feb 2016 Emerging Preferred HP Routes
— 7th Feb 2016 Emerging Preferred IP Routes

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PROJECT

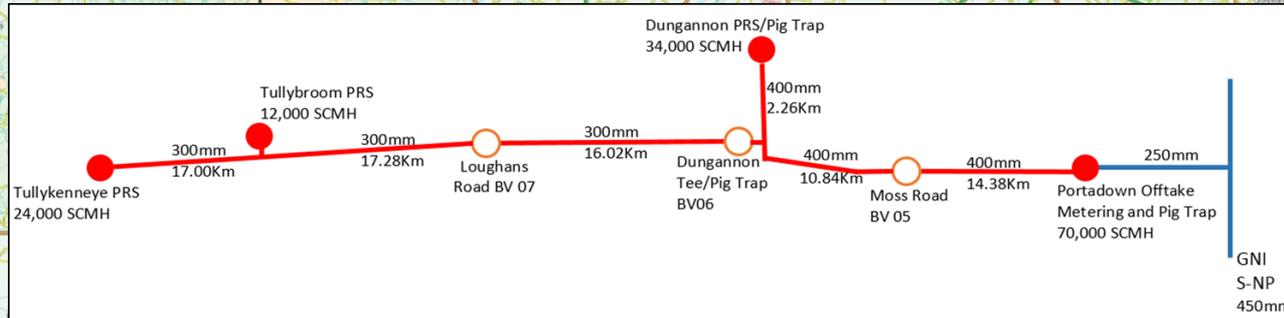
SGN Gas to the West

TITLE

Overview Map (With Measurements)

RPS Elmwood House T: 028 9066 7914
74 Boucher Road F: 028 9066 8286
Belfast W: www.rpsgroup.com/ireland
BT12 6RZ E: ireland@rpsgroup.com

Drawing No.: IBE0999/0002
 Revision No.: 05
 Drawn By.: SM
 Checked By.: MM
 Approved By.: MB
 Date: 15/02/2016
 SCALE: 1:200,000 A3



UKOPA Mutual Energy Pipeline System

Questions?

Emmet McFadden
Gas Operations Manager
27th February 2018