Packaging RfG work

- A project plan and assumption log has been developed to track modifications related to RfG deliverables
- It assumes June 2016-2017 for code implementation (ie 1 year for code implementation and another year for manufacturer implementation), this date being dependant on conclusion of the RfG drafting process *currently assumed* for June 2015
- Commencement of some work (such as banding and compliance) begins ‘immediately’ to ensure GB compliance by entry-into-force
- Technical requirements deriving from the Generator bandings have been bundled into thematic chunks, and will be taken forward as separate Working Groups and Modifications in 2015/16

Modification Grouping (1)

- Workstream 1 / Mod 1 - Structure / Banding

- Workstream 2 / Mod 2 – Compliance

Modification Grouping (2)

- Workstream 3 / Mod 3 - General
  - Glossary and Definitions*
  - Remote operations / automatic connection and disconnection
  - Control Schemes and settings
  - Protection
  - Simulation models
  - Operational Metering
  - Dynamic System Monitoring / Fault Recording / Quality of Supply Monitoring
  - Synchronising facilities
  - Black Start / Island operation / Trip to Houseload
  - Rates of change of Active Power
  - Earthing
  - Plant Changes / Modifications
  - Offshore
  - Derogations
  - Emerging Technologies

Modification Grouping (2)

- Workstream 4 / Mod 4 – Fault Ride Through
  - Fault Ride Through – Synchronous / Non Synchronous (Types B – D)
  - Active Power Recovery
  - Reactive Current Injection
- Workstream 5 / Mod 5 – Voltage / Reactive Power
  - Voltage Range
  - Reactive Capability (Synchronous)
  - Reactive Capability (Asynchronous)
  - Excitation performance (Synchronous)
  - Voltage Control performance (Asynchronous)
  - Control Modes (Voltage Control, Reactive Power Control and Power Factor Control)
  - Power Oscillation Damping

Modification Grouping (2)

- Workstream 6 / Mod 6 – Frequency
  - Frequency Range
  - Rate of Change of Frequency
  - Limited Frequency Sensitive Mode under and over frequency (LFSM-U / LFSM-O)
  - Frequency Sensitive Mode (FSM)
  - Maintenance of Active Power
  - Power Output with falling frequency
  - Synthetic Inertia
  - Ancillary Services Monitoring

Aggregation of Issues into Workstream / Modifications

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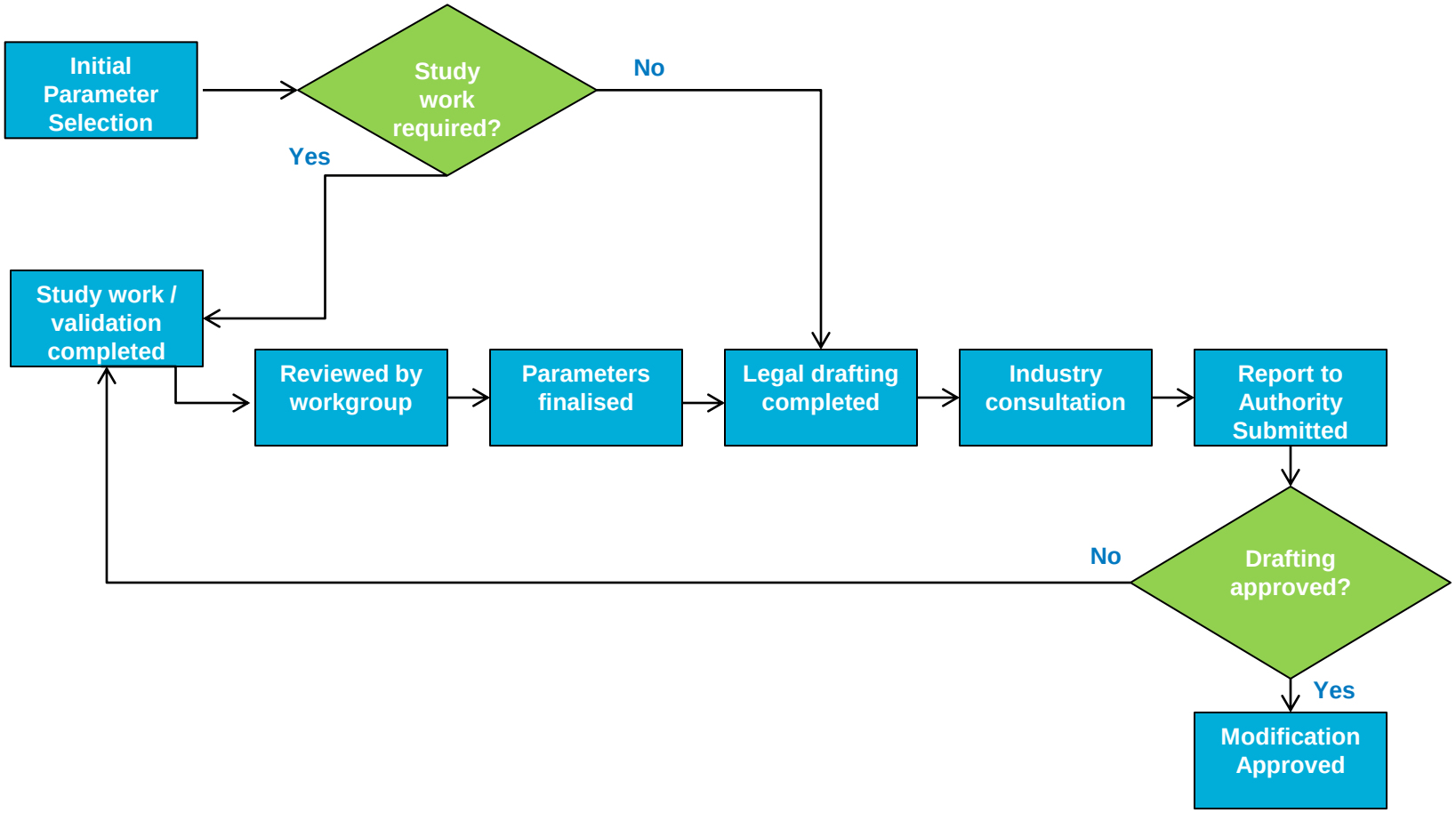
- Workstream 1 / Mod 1 - Structure / Banding
  - 3/11/14 – 13/11/15
- Workstream 2 / Mod 2 – Compliance
  - 3/11/14 – 13/11/15
- Workstream 3 / Mod 3 - General
  - 1/04/15 – 04/03/16
- Workstream 4 / Mod 4 – Fault Ride Through
  - 1/04/15 – 04/03/16
- Workstream 5 / Mod 5 – Voltage and Reactive Power
  - 01/4/15 – 04/03/16
- Workstream 6 / Mod 6 – Frequency
  - 01/4/15 – 04/03/16

National Parameter Modification Alignment

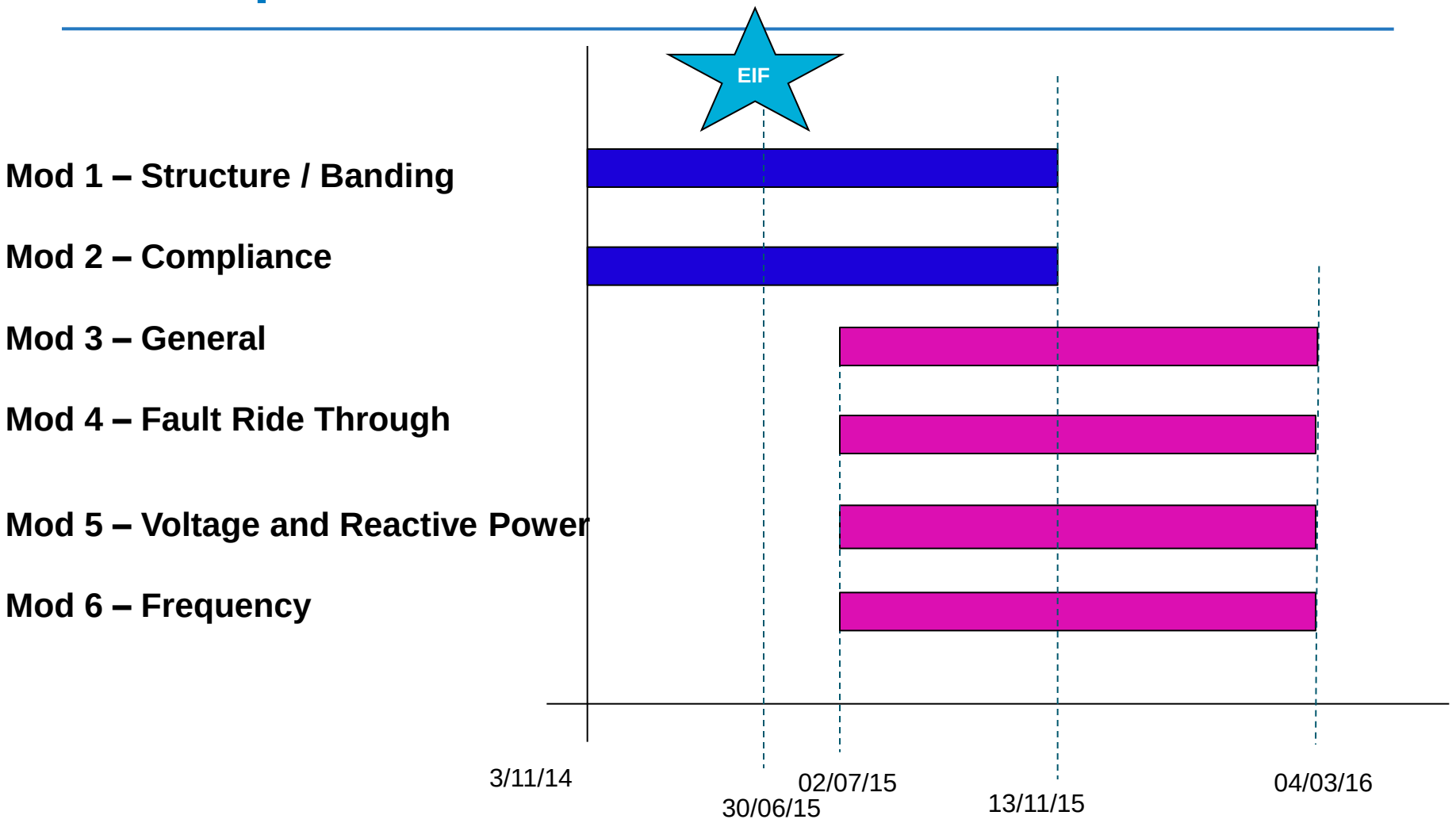
National Parameter Selection

Mod 4 Fault Ride Through	Mod 5 Voltage and Reactive Power	Mod 6 Frequency
Type B	Type D	Frequency Ranges
Fault Ride Through Synch	Voltage Range 110kV - 300kV	Rate of change of frequency
Fault Ride Through Asynch	Voltage Range 300kV - 400kV	LFSM-O
Type D	Type C Synch	Maintenance of constant power
Fault Ride Through Synchronous	Reactive Power Capability at Maximum Capacity	Power Output with falling frequency
Fault Ride Through Asynchronous	Reactive Power Capability below Maximum Capacity	Type C
Type B Synch	Type D	LFSM-U
Fault Ride Through Active Power Recovery	Specifications and performance of AVR and Excitation System	FSM
Type B PPM's	Type C PPMs	ASBMON
Fast Fault Current Injection	Reactive Capability at Maximum Capacity	
Post Fault Active Power Recovery	Reactive Capability below Maximum Capacity	
Type C PPM's	Reactive Power Control Modes	
Fault Ride Through - Priority of Active or Reactive Power Contribution	Voltage Control	
	Reactive Power Control	
	Power Factory Control	
	Selection of Power Factor Control , Reactive Power Control or Voltage Control	
	Offshore PPM's	
	Voltage Range	
	Voltage Stability requirements	
	Reactive Capability at Maximum Capacity	

RfG National Parameter Process



RfG Implementation : Timeline



RfG Code Modification Timeline

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Task Name	Duration	Start	Finish
GB CODE MODIFICATION PROCESS	**288 days**	**Wed 28/01/15**	**Fri 04/03/16**
Modification Timeline One: Mod 1 Banding and Structural and Mod 2 Compliance Processes	**208 days**	**Wed 28/01/15**	**Fri 13/11/15**
Grid Code	**124 days**	**Wed 28/01/15**	**Mon 20/07/15**
Distribution Code - Stage 1	**108 days**	**Mon 02/03/15**	**Wed 29/07/15**
Distribution Code - Stage 2	**109 days**	**Mon 02/03/15**	**Thu 30/07/15**
Industry Consultation	**46 days**	**Fri 31/07/15**	**Fri 02/10/15**
Report to the Authority	**5 days**	**Mon 05/10/15**	**Fri 09/10/15**
Modification Approval	**25 days**	**Mon 12/10/15**	**Fri 13/11/15**
Modification Time Line Two : Mod 3 General, Mod 4 Fault Ride Through, Mod 5 Voltage and Reactive Power and Mod 6 Frequency	**189 days**	**Tue 16/06/15**	**Fri 04/03/16**
Grid Code	**98 days**	**Thu 02/07/15**	**Mon 16/11/15**
Distribution Code - Stage 3	**153 days**	**Tue 16/06/15**	**Thu 14/01/16**
Industry Consultation	**50 days**	**Mon 16/11/15**	**Fri 22/01/16**
Report to the Authority	**5 days**	**Mon 25/01/16**	**Mon 01/02/16**
Modification Approval	**25 days**	**Mon 01/02/16**	**Fri 04/03/16**