

# STCP Amendment Proposal Form

PA038

**1. Title of Amendment Proposal**

STCP 22-1 – Creation of new STCP and incorporation within Schedule 2 of the STC

**2. Description of the Proposed Amendment (mandatory field)**

The creation of STCP 22-1: Production of Models for GB System Planning and its incorporation within Schedule 2 of the STC.

It is proposed that this STCP Amendment becomes effective on 30<sup>th</sup> September 2005.

**3. Description of Issue or Defect that Proposed Amendment seeks to Address (mandatory field)**

Prior to BETTA Go-Live the STC Parties identified a number of STCPs that while necessary were not required to be introduced before the BETTA Go-Live Date of 1 April 2005.

Since the BETTA Go-Live Date the development of these STCPs has progressed to such a stage that a number of these STCPs are now ready to be formally created and incorporated with Schedule 2 of the STC. This STCP Amendment Proposal proposes that STCP 22-1: Production of Models for GB System Planning is created and incorporated within Schedule 2 of the STC.

**4. Impact on the STC (information should be given where possible)**

STCP 22-1: Production of Models for GB System Planning

**5. Impact on other frameworks e.g. CUSC, BSC (information should be given where possible)**

NONE

**6. Impact on Core Industry Documentation (information should be given where possible)**

NONE

**7. Impact on Computer Systems and Processes used by STC Parties (information should be given where possible)**

NONE

**8. Details of any Related Modifications to Other Industry Codes (where known)**

NONE

**9. Justification for Proposed Amendment with Reference to Applicable STC Objectives (mandatory field)**

Although the introduction of this STCP was not deemed as critical for Go-Live it is the view of the proposer that should this STCP now be created and incorporated within Schedule 2 of the STC this would better facilitate the following Applicable STC Objectives:

- the development, maintenance and operation of an efficient, economical and co-ordinated system of electricity transmission
- protection of the security and quality of supply and safe operation of the GB Transmission System insofar as it relates to the interactions between transmission licensees
- promotion of good industry practice and efficiency in the implementation and administration of the arrangements described in the STC.

<b>Details of Proposer</b> Organisation's Name	National Grid Electricity Transmission plc
Capacity in which the Amendment is being proposed (i.e. STC Party or other Party as designated by the Authority pursuant to STC section B7.2.2.1 (b))	STC Party
<b>Details of Proposer's Representative</b> Name Organisation Telephone Number Email Address	Andrew Truswell National Grid 01926 656388 <a href="mailto:Andrew.Truswell@ngtuk.com">Andrew.Truswell@ngtuk.com</a>
<b>Details of Representative's Alternate</b> Name Organisation Telephone Number Email Address	Ben Graff National Grid 01926 656368 <a href="mailto:Ben.Graff@ngtuk.com">Ben.Graff@ngtuk.com</a>
<b>Attachments (Yes/No): No</b> If yes, title and number of pages of each attachment:	

**Notes:**

1. Those wishing to propose an Amendment to the STC should do so by filling in this "Amendment Proposal Form" that is based on the provisions contained in Section 7.2 of the STC.
2. The Committee Secretary will check that the form has been completed, in accordance with the requirements of the STC, prior to submitting it to the Committee. If the Committee Secretary accepts the Amendment Proposal form as complete, then she/he will write back to the Proposer informing them of the reference number for the Amendment Proposal and the date on which the Committee will consider the Proposal. If, in the opinion of the Committee Secretary, the form fails to provide the information required in the STC, then he/she may reject the Proposal. The Committee Secretary will inform the Proposer of the rejection and report the matter to the Committee at their next meeting. The Committee can reverse the Committee Secretary's decision and if this happens the Committee Secretary will inform the Proposer.

The completed form should be returned to:

Lilian Macleod  
STC Committee Secretary  
Commercial Frameworks  
National Grid Company plc

NGT House  
Warwick Technology Park  
Gallows Hill  
Warwick, CV34 6DA

Or via e-mail to: [STCTeam@uk.ngrid.com](mailto:STCTeam@uk.ngrid.com)

**Attachment 1: Legal Text for STCP 20-1 Seven Year Statement**

# ***STCP22-1 Issue 001 Production of Models for GB System Planning***

## ***STC Procedure Document Authorisation***

<b>Company</b>	<b>Name of Party Representative</b>	<b>Signature</b>	<b>Date</b>
National Grid Electricity Transmission plc			
SP Transmission Ltd			
Scottish Hydro-Electric Transmission Ltd			

## ***STC Procedure Change Control History***

Issue 001	30/09/2005	First issue following BETTA Go-Live
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## 1 Introduction

### 1.1 Scope

1.1.1 This procedure shows the information flows required between Parties to produce GB Models for the various processes that require system studies to be undertaken. These processes include those in STCP 16-1: Investment Planning, STCP 20-1: Seven Year Statement, STCP 18-1: Connection and Modification Applications and STCP 18-2: Use of System Application. In order for NGET to provide Planning Assumptions to the TOs, NGET will produce Ranking Orders taking in to account market utilisation information. These Ranking Orders go part of the way to fulfilling the NGET's obligation to provide Planning Assumptions for various purposes.

1.1.2 This procedure applies to NGET and each TO. For the purposes of this document, TOs are:

- SPT; and
- SHETL.

### 1.2 Objectives

1.2.1 The objectives of this STCP are to detail how GB Models are produced and agreed; and to address how the information is managed across the interface between NGET and the TOs to ensure consistency of the GB Models.

## 2 Key Definitions

### 2.1 *For the purposes of STCP 22-1 Production of Models for GB System Planning:*

2.1.1 **Boundary of Influence (BoI)** means the criteria for determining which Construction Projects or proposed changes to a TO or NGET Transmission System may have a material impact on other TOs as determined by Schedule 4 of the STC.

2.1.2 **Confirmed Network Reinforcement** means a scheme that has been identified by the relevant Party as having a high probability of being delivered.

2.1.3 **Contracted Generation** means a Generator that has connected to the GB Transmission System or accepted an offer for connection to or modification or use of system offer from NGET

2.1.4 **Data Lookup Table** means a table created to facilitate the conversion of data between different formats

2.1.5 **Final Compliant GB SYS Model** means a model of GB Transmission System containing Seven Year Statement demand and generation profiles, and also a set of reinforcements to make the model compliant with GB SQSS.

2.1.6 **Hybrid GB Investment Planning Model** for each TO means a model of the GB Transmission System containing a best view of generation and demand data, within the Boundary of Influence for each TO, and the relevant Final Compliant GB SYS Model outside the Boundary of Influence.

- 2.1.7 **Investment Planning** means the process to produce the Transmission Investment Plan.
- 2.1.8 **GB Model** means a representation of GB Transmission System including a representation of generation and demand.
- 2.1.9 **TO Model** means a representation of TO Transmission System including a representation of generation within the Ranking Order and demand, although the specific values associated with generation output or the demands are not critical.
- 2.1.10 **NGET Investment Planning Data Coordinator** means a person in NGET responsible for the collection and maintenance of data required to be exchanged by all Parties for Investment Planning purposes.
- 2.1.11 **Preliminary GB SYS Model** means a model of the GB Transmission System containing Seven Year Statement demand and generation profiles, but not necessarily all reinforcements to make the data compliant with GB SQSS.
- 2.1.12 **Project Listings Document** means a document detailing a set of planned changes to TO/NGET Transmission System.
- 2.1.13 **Ranking Order** means a listing of generation in order of likely market utilisation. The generation to be listed will be agreed within the Investment Planning Study Guidelines.
- 2.1.14 **Speculative Generators** means Generators included in Investment Planning Ranking Orders to represent future projects that may connect, but about which NGET has received no formal approach.
- 2.1.15 **Summer Minimum GB Investment Planning Model** means a model created to enable the study of Transmission System stability, with an explicit representation of generation expected to run at the summer minimum condition.

### **3 Procedure**

#### **3.1 Committees/Liaison Groups**

- 3.1.1 The Joint Planning Committee (JPC) shall co-ordinate the production of the GB Models.

#### **3.2 Determination of Boundary of Influence**

- 3.2.1 The criteria to be used by the JPC for the assessment of the Boundary of Influence are specified in Appendix D. These criteria may require amendment for time to time to take into account revisions suggested by Parties during Investment Planning.
- 3.2.2 The JPC may agree that no revision is required to the existing Boundary of Influence and this existing Boundary of Influence can then be adopted for the Investment Planning studies.
- 3.2.3 If the JPC agree that a revision to the Boundary of Influence may be required, then the process determined in the remainder of this section shall be followed.
- 3.2.4 The JPC shall first review the criteria in Appendix D. If the JPC agree that the criteria in Appendix D should be revised, they shall use reasonable endeavours to agree revised criteria. If the JPC agrees revised criteria, then

- NGET shall propose a formal amendment to this STCP in respect of Appendix D, and
- The agreed proposed criteria shall be used in the study process below.

If either the JPC agree not to revise the criteria, or no agreement is reached on revised criteria, the existing Appendix D criteria shall be used in the study process below.

- 3.2.5 Each TO shall submit to NGET a proposed list of transmission sites for modelling the impact of additional generation. The choice of transmission sites shall reflect the geographic spread, the mix of relevant substation voltages within each company area, and take account of any transmission sites where there is a specific concern over current fault duties being close to Plant ratings.
- 3.2.6 NGET shall take the relevant change criteria, the sites proposed by the TOs and its own list of Generation sites, and undertake GB Transmission System analysis to determine the draft Boundary of Influence.
- 3.2.7 NGET shall produce the results of the draft Boundary of Influence in the form of a table and/or diagram, and circulate this to the TOs. The table and/or diagram will be such that all sites within the relevant TOs Transmission System experience a change less than that allowed by the above criteria when an additional Generator of an agreed size is connected outside of the Boundary of Influence.
- 3.2.8 If the TOs disagree with the draft Boundary of Influence, the JPC will use reasonable endeavours to agree actions to ascertain if a modification to the Boundary of Influence is required. Depending on the results of this analysis, NGET may then redraft the Boundary of Influence and re-issue to the TOs.
- 3.2.9 When all Parties agree, the JPC shall approve the Boundary of Influence. NGET shall propose any changes to Schedule 4 of the STC required as the result of the revised Boundary of Influence via the STC Change Procedure (STC Part B section 7.2).

### **3.3 *Creation of Investment Planning Winter Peak Models***

- 3.3.1 Investment Planning Winter Peak Models are used as part of the Investment Planning process STCP 16-1.
- 3.3.2 NGET shall create a draft Ranking Order for the winter peak for each of the study years in the Investment Planning timeframe (see pro forma in Appendix A). For Investment Planning purposes, NGET may include Speculative Generators in the Ranking Orders.
- 3.3.3 NGET shall also create TO specific versions of all Ranking Orders and draft Ranking Orders produced for the Investment Planning winter peak pursuant to this section 3.3, The draft TO specific Ranking Orders will be equivalent to the Ranking Order within a TO's Boundary of Influence. Outside a TO's Boundary of Influence, NGET shall insert equivalent information from the SYS so that no commercially sensitive information regarding individual Generators is shared with the TO. When NGET is required to send a Ranking Order or draft Ranking Order to a TO pursuant to this section 3.3, NGET shall send the relevant TO specific Ranking Order to that TO.
- 3.3.4 NGET shall supply each TO with the draft Ranking Order, a total GB demand forecast (both active and reactive demand), a forecast of demand for each of the Transmission Licence areas (both active and reactive demand), and an estimate of losses for each year for populating TO Models of their Transmission System.



- 3.3.5 Each TO shall submit any comments on the draft Ranking Orders and demand forecasts to NGET. If the Parties agree that changes are required to the draft Ranking Orders or demand forecasts following comments by the TOs, these shall be incorporated into the Ranking Orders or demand forecasts, which NGET shall re-issue to each TO for comment with the aim of reaching agreement on the Ranking Orders or demand forecasts.
- 3.3.6 The TOs shall ensure that they submit PLDs to NGET in respect of proposed network configuration changes which will be included in the TO Models that they will submit to NGET. All Parties shall ensure that they exchange PLDs with each other for proposed network changes within the Boundary of Influence.
- 3.3.7 Each TO shall submit TO Models to NGET for all study years in the Investment Planning timescale
- 3.3.8 Each TO shall ensure that all TO Model entries and PLDs are supported by entries in the Data Lookup Tables to allow for conversion between model formats. The process to update the data in the Data Lookup Tables is described in 3.9. Each Speculative Generator in respect of a TOs Transmission System will have an associated Project Listing Document (PLD) developed by the relevant TO.
- 3.3.9 On receipt of the TO Models from each TO, NGET shall analyse the TO Models to examine year on year changes. NGET shall cross-reference the network configuration changes to the PLDs and the generation changes to the Ranking Orders. Comments on any changes to TO Models that do not cross-reference to PLDs or Ranking Orders as appropriate shall be fed back to the appropriate TO as soon as reasonably practicable. The TOs will then have the opportunity to issue new PLDs or to revise and resubmit their TO Models to NGET, with a view to reaching a consistent submission. Relevant Parties may agree to an additional iteration as necessary.
- 3.3.10 NGET shall perform data verification to ensure correct TO Model conversion, and that the network configuration is maintained and that the parameters for all lines, transformers, reactors etc are properly converted. Additional model conversion guidance is provided in the “GB System Planning Data Exchange Issues” document. This JPC controlled document lists problems and solutions discovered during previous model conversions.
- 3.3.11 For each study year, NGET shall then create a GB Model from the TO Models, NGET’s own model of its Transmission System, the Ranking Orders and the demand forecasts. NGET shall run the GB Models to see if the base case models are convergent. If convergence is not achieved, the Parties will meet to agree additions to the GB Models to help achieve convergence. This may include the addition of proposed Transmission System changes, supported by PLDs, which, although not yet Confirmed Network Reinforcements are known to be required to address particular problems in the models.
- 3.3.12 NGET shall create Hybrid GB Investment Planning Models (hybrid models) for each TO with Investment Planning GB Model data within each TO’s Boundary of Influence and final compliant GB SYS data outside the Boundary of Influence. The hybrid model demand shall be scaled to match the forecast GB demand. The hybrid model shall contain generation capacity required to be committed to meet the GB SQSS standard (demand plus losses plus 20%), with generation output scaled to meet demand + losses. Wind generation shall be scaled to an agreed availability factor documented in the Investment Planning Study Guidelines. NGET shall ensure convergence of these hybrid models.

- 3.3.13 NGET shall then submit the Hybrid GB Investment Planning Models to the TOs. NGET shall ensure that all hybrid model entries and PLDs are supported by entries in the Data Lookup Tables to allow for conversion between model formats. NGET shall develop a PLD in respect of each Speculative Generator in respect of NGET's Transmission System within a TO's Boundary of Influence.
- 3.3.14 The Parties shall then undertake consistency checking in accordance with the process set out in section 3.10.

### **3.4 Creation of Summer Minimum GB Investment Planning Model**

- 3.4.1 NGET shall provide a draft Ranking Order for the summer minimum to each TO, explicitly listing all plant expected to be running at the summer minimum condition for each of the study years in the Investment Planning timeframe, together with an associated GB demand forecast (both active and reactive demand), a forecast of demand for each of the Transmission Licence areas (both active and reactive demand), and an estimate of losses for each year.
- 3.4.2 Each TO shall submit any comments on the draft Ranking Orders or demand forecasts to NGET. If the Parties agree that changes are required to the draft Ranking Orders or demand forecasts following comments by the TOs, these shall be incorporated into the Ranking Orders or demand forecasts, which NGET shall re-issue to each TO for comment with the aim of reaching agreement on the Ranking Orders or demand forecasts.
- 3.4.3 The TOs shall take the Ranking Orders and demand forecasts, identify any additional generation plant in each Ranking Order in respect of their own Transmission System as compared to the Ranking Order for the previous winter peak and incorporate these changes in the previous winter peak TO Models to form the Summer Minimum TO Investment Planning Models for the agreed study years. All generation sets shall be modelled with their full TEC output in these TO Models if they are listed in the Ranking Orders. The TOs shall also add in only those Confirmed Network Reinforcements that are expected to be completed since the previous winter peak and connections for any new generators that are expected to be commissioned. The TOs shall ensure that PLDs are exchanged in respect of these reinforcements.
- 3.4.4 The TOs then submit these TO Models to NGET for the agreed study years in the Investment Planning timescale.
- 3.4.5 Each TO shall ensure that all TO Model entries and PLDs are supported by entries in the Data Lookup Tables to allow for conversion between model formats. The process to update the data in the Data Lookup Tables is described in 3.9.
- 3.4.6 On receipt of the TO Models from each TO, NGET shall analyse the TO Models to examine year on year changes. NGET shall cross-reference the network configuration changes to the PLDs and the generation changes to the Ranking Orders. Comments on any changes that do not cross-reference to the PLDs or Ranking Orders as appropriate shall be fed back to the appropriate TO as soon as reasonably practicable. The TOs will then have the opportunity to issue new PLDs or to revise and resubmit their TO Models, with a view to reaching a consistent submission. Relevant Parties may agree to an additional iteration as necessary.
- 3.4.7 NGET shall perform data verification to ensure correct TO Model conversion and that the network configuration is maintained and that the parameters for all lines, transformers, reactors etc are properly converted. Additional model conversion guidance is provided in the "GB System Planning Data Exchange Issues" document. This JPC controlled document lists problems and solutions discovered during previous model conversions.

- 3.4.8 NGET shall create GB Models from the TO Models, NGET's own model of its Transmission System, and through applying the Summer Minimum Investment Planning demand and the Ranking Orders.
- 3.4.9 NGET shall run the GB Models to see if the base case GB Models are convergent. If convergence is not achieved, the Parties will meet to agree additions to the Models to help achieve convergence. This may include the addition of proposed Transmission System changes, supported by PLDs, which, although not yet Confirmed Network Reinforcements are known to be required to address particular problems in the models.
- 3.4.10 NGET shall ensure that the GB Models are convergent with whole set modelling and generator output set to meet demand plus losses. Wind generation shall be scaled to an agreed availability factor documented in the "Investment Planning Study Guidelines".
- 3.4.11 NGET shall then issue the convergent Summer Minimum GB Investment Planning Model to the TOs. NGET shall ensure that all model entries and PLDs are supported by entries in the Data Lookup Tables to allow for conversion between model formats. All generation shall be listed in the Ranking Orders.
- 3.4.12 The JPC will also agree a typical outage pattern to be applied to the Model.
- 3.4.13 The Parties shall then undertake consistency checking in accordance with the process set out in 3.10.

### **3.5 Creation of Preliminary SYS Models**

- 3.5.1 NGET shall provide a draft Ranking Order to each TO, explicitly listing Contracted Generation for each of the seven years in the SYS timeframe together with an associated GB demand forecast (both active and reactive demand), a forecast of demand for each of the Transmission Licence areas (both active and reactive demand), and an estimate of losses for each year.
- 3.5.2 Each TO shall submit any comments on the draft Ranking Orders or demand forecasts to NGET. If the Parties agree that changes are required to the draft Ranking Orders or demand forecasts following comments by the TOs, these shall be incorporated into the Ranking Orders or demand forecasts, which NGET shall re-issue to each TO for comment with the aim of reaching agreement on the Ranking Orders or demand forecasts.
- 3.5.3 The TOs shall take the Ranking Orders and demand forecasts and use them to populate TO Models of their own Transmission System. All generation sets will be modelled with their full TEC output in these TO Models if they are listed in the generation Ranking Order. The TOs shall include all Confirmed Network Reinforcements at this stage. The TOs shall ensure that they have submitted PLDs to NGET in respect of the Confirmed Network Reinforcements. All Parties shall ensure that they have exchanged PLDs with each other Party for Confirmed Network Reinforcements within the Boundary of Influence. Note: All generation in the Ranking Order will be contracted and therefore should have an existing PLD.).
- 3.5.4 The TOs shall submit their TO Models to NGET for all seven years in the SYS timescale.
- 3.5.5 Each TO shall ensure that all TO Model entries and PLDs are supported by entries in the Data Lookup Tables to allow for conversion between model formats. The process to update the data in the Data Lookup Tables is described in section 3.9.

- 3.5.6 On receipt of the TO Models from each TO, NGET shall analyse the models to examine year on year changes. NGET shall cross-reference the network configuration changes to the PLDs and the generation changes to the Ranking Orders. Comments on any changes to TO Models that do not cross-reference to PLDs or Ranking Orders as appropriate shall be fed back to the appropriate TO as soon as reasonably practicable. The TOs will then have the opportunity to issue new PLDs or to revise and resubmit the TO Models to NGET, with a view to reaching a consistent submission. Relevant Parties may agree to an additional iteration as necessary.
- 3.5.7 NGET shall perform data verification to ensure correct TO Model conversion and that the network configuration is maintained and that the parameters for all lines, transformers, reactors etc are properly converted. Additional model conversion guidance is provide in the “GB System Planning Data Exchange Issues” document. This JPC controlled document lists problems and solutions discovered during previous model conversions.
- 3.5.8 NGET shall then create Preliminary GB SYS Models from the TO Models, from NGET’s own model of its Transmission System, and through applying the SYS demand profile and the Ranking Orders. The models shall contain generation capacity committed to meet the GB SQSS standard (demand plus losses plus 20%), with generation output scaled to meet demand plus losses. Wind generation shall be scaled to an agreed availability factor documented in the SYS Study Guidelines.
- 3.5.9 NGET shall run the Preliminary GB SYS Models to find if the base case models are convergent. If convergence is not achieved, the Parties will meet to agree additions to the Models to help achieve convergence. This may include the addition of proposed Transmission System changes, supported by PLDs, which, although not yet Confirmed Network Reinforcements are known to be required to address particular problems in the models.
- 3.5.10 NGET shall issue the convergent Preliminary GB SYS Models to the TOs, NGET shall ensure that all model entries and PLDs are supported by entries in the Data Lookup Tables to allow for conversion between model formats.
- 3.5.11 The Parties shall then undertake consistency checking in accordance with the process set out in section 3.10.

### **3.6 Creation of final compliant GB SYS Models**

- 3.6.1 The input for the creation of final compliant GB SYS Models is the GB Seven Year Statement process, STCP 20-1. However outputs of section 3.6 are used for the Connections and Modification Application process, STCP 18-1, and the Use of System Application process, STCP 18-2.
- 3.6.2 The annual process for the production of the Seven Year Statement will result in a list of reinforcement schemes which are required for compliance with the GB SQSS, against the Seven Year Statement Ranking Order. The Parties shall use these schemes to update the preliminary SYS models of their own Transmission Systems. The Parties shall ensure that all year on year changes in models for any new schemes included at this stage will be supported by appropriate entries in the Data Lookup Tables. The TOs shall ensure that all year on year changes in models are supported by PLDs, while NGET shall ensure that all year on year changes in models with a TO’s Boundary of Influence are supported by PLDs.
- 3.6.3 Any new entries or changes to the lookup tables shall be submitted to the NGET Investment Planning Data Coordinator, using the process and forms detailed in Appendix B.

- 3.6.4 The TOs shall submit their compliant TO Models for all seven years in the timescales agreed in the SYS Study Guidelines to NGET.
- 3.6.5 On receipt of the TO Models from each TO, NGET shall analyse the models to show year on year changes. NGET shall cross-reference the network configuration changes to the PLDs and the generation changes to the Ranking Orders. Comments on any changes that do not cross-reference to PLDs or Ranking Orders as appropriate shall be fed back to the relevant TO as soon as reasonably practicable. The TOs will then have the opportunity to issue new PLDs or revise and resubmit their TO Models to NGET, with a view to reaching a consistent submission.
- 3.6.6 NGET shall perform data verification to ensure correct TO Model conversion.
- 3.6.7 NGET shall then create Final Compliant GB SYS Models for each year from the TO Models, from NGET's own model of its Transmission System, and through applying the SYS demand Profile and the Ranking Orders. The models shall contain generation capacity committed to meet the GB SQSS standard (demand plus losses plus 20%), with generation output scaled to meet demand plus losses. Wind generation shall be scaled to an agreed availability factor documented in the SYS Study Guidelines.
- 3.6.8 NGET shall ensure that the GB Models are convergent.
- 3.6.9 NGET shall issue Final Compliant GB SYS Models to each TO. NGET shall ensure that all model entries and PLDs are supported by entries in the Data Lookup Tables to allow for conversion between model formats.
- 3.6.10 The Parties shall then undertake consistency checking in accordance with the process set out in 3.10.

### **3.7 Creation of SYS quarterly updates**

- 3.7.1 In accordance with the STCP 20-1: GB Seven Year Statement, NGET shall issue quarterly updates for the SYS. These will contain all changes to the Contracted Ranking Order and an update of all the Confirmed Network reinforcement schemes at an agreed date. A corresponding GB Model and Ranking Order shall be issued.
- 3.7.2 When schemes are confirmed (or confirmed schemes postponed or cancelled) the relevant TO shall provide an updated PLD and TO Model to NGET. NGET shall produce comparisons on these models to produce a series of changes associated with new connections or recently confirmed schemes (or confirmed schemes postponed or cancelled). At the time of the SYS update, NGET shall take the Final Compliant GB SYS Model, and apply the changes to produce a background corresponding to the latest Ranking Order with all confirmed schemes included. The GB Models shall then be re-issued to the relevant TO. At the same time a Ranking Order will be issued, containing all Contracted Generation at the time of the update, (along with a description of the changes in the Ranking Order since the last issue). The demand background will be the same as that applied to the production of the annual SYS update.
- 3.7.3 At this stage each Party shall run the GB SYS quarterly models to see if the base case models are convergent. If convergence is not achieved, the Parties will meet to agree additions to the GB SYS quarterly models to help achieve convergence. This may include the addition of proposed Transmission System changes, supported by PLDs, which although not yet confirmed schemes, are known to be required to address particular problems in the models.

3.7.4 NGET shall reissue the GB SYS quarterly models with the additional Transmission System changes agreed in 3.7.3.

3.7.5 Note: The GB Model issued by NGET will be correct in respect of the quarterly update, the generation profile will correspond to the current contracted background and all confirmed schemes will be included. However, the GB Model may no longer be fully compliant with the GB SQSS. Conversely, there may be more schemes in the quarterly update than are now needed to maintain compliance with the GB SQSS. Generators that have terminated their agreements will remain in the models but will have zero output.

### **3.8 Provision of Construction Planning Assumptions**

3.8.1 Following a NGET Construction Application, NGET may provide each Affected Party with a set of Construction Planning Assumptions. This will include a Contracted Generation Ranking Order containing all connected generation or generation with signed Connection Offers at the time the new application is received. If the NGET Construction Application is for a generation connection, the new generation will be included in the Ranking Order at an appropriate position.

3.8.2 NGET shall also provide each Affected Party with a list of changes (new connections and infrastructure) that would bring the latest GB SYS Model into line with the Construction Planning Assumptions. The latest GB SYS Model is the later of the Final Compliant GB SYS Models and the latest GB SYS quarterly update model produced under section 3.7.

On receipt of the models, each TO shall undertake consistency checking in accordance with the process set out in 3.10.

### **3.9 Process for updating data look up tables**

3.9.1 In order to facilitate data exchange between the differing Parties modelling systems, a process has been developed to translate elements between TO PSS/e data and NGET ELLA formats using Data Lookup Tables. Some of the information that differs between the TOs and NGET includes the conventions for site names, circuit identifiers, transformer node names and generation identifiers.

3.9.2 In order for the data exchange process to function correctly, the Data Lookup Tables shall be maintained by the NGET Investment Planning Data Co-ordinator, with complete sets of current information covering the GB Transmission System. An updated look-up table should be issued with each annual/ quarterly submission of SYS/ Investment Planning data.

3.9.3 Whenever equipment used in planning GB Models or TO Models are added, changed or deleted, the details held within the relevant Data Lookup Table shall be updated as part of the initial process. All changes shall be reported to the NGET Investment Planning Data Co-ordinator using the forms in Appendix B. NGET shall acknowledge receipt and update the tables.

3.9.4 Each TO shall submit any new site location code entries for the Data Lookup Table to the NGET Investment Planning Data Co-ordinator, to ensure the names or identifier do not conflict with existing values. If a possible conflict is identified the proposed value must be changed to remove the conflict. The forms for submitting changes are included in Appendix B.

- 3.9.5 If NGET agrees with the proposed new site location code, NGET shall acknowledge receipt of the form, confirming that it has no objections and the changes can be included in the TO and GB Models.
- 3.9.6 If NGET does not agree with the new site location code, NGET shall respond to the TO with suggestions for an alternative form. If the TO is willing to conform to these suggestions, that TO shall re-submit the changes form, NGET shall acknowledge receipt and agree the changes.
- 3.9.7 If any of the Parties cannot agree on the proposed new site location codes, then the dispute resolution process will be invoked.

### **3.10 Consistency checking process**

- 3.10.1 The JPC shall agree a set of comparisons that can be used to perform consistency checks on the GB Models. The consistency checks agreed may vary depending upon the models being studied and the timescales involved.
- 3.10.2 Parties shall each study the agreed set of comparisons and report the results for comparison. Any differences that fall outside agreed tolerances would be noted.
- 3.10.3 If the GB Models are consistent, then these are approved by all Parties for use in further planning processes such as developing the GB Investment Plan, or the GB SYS.
- 3.10.4 If there are not consistent results from the GB Models, Parties shall investigate the inconsistency, co-ordinated by JPC.
- 3.10.5 Where inconsistencies are found as a result of erroneous GB Model data, the correct data will be agreed and the GB Models will be updated.
- 3.10.6 Where inconsistencies are found as a result of the Boundary of Influence the Boundary of Influence may need to be amended, in accordance with the STC, until the differences between the GB Models results fall within agreed tolerances. The Boundary of Influence tolerances will also be updated as per section 3.2 to ensure that this inconsistency is not repeated. (NB this will not be relevant for SYS Models.
- 3.10.7 Where inconsistencies are found but cannot be resolved, the issue will be discussed by the JPC and a treatment will be agreed between all Parties. This may include a relaxation of the consistency tolerances previously agreed or an agreement that further sensitivity studies are performed by all Parties as their Project Listings are formulated.

### **3.11 Generator Data Provision**

- 3.11.1 Grid code standard and detailed generator planning data shall be provided to each TO when it becomes available following yearly update.
- 3.11.2 Connection and modification data shall be provided as STCP18-1.

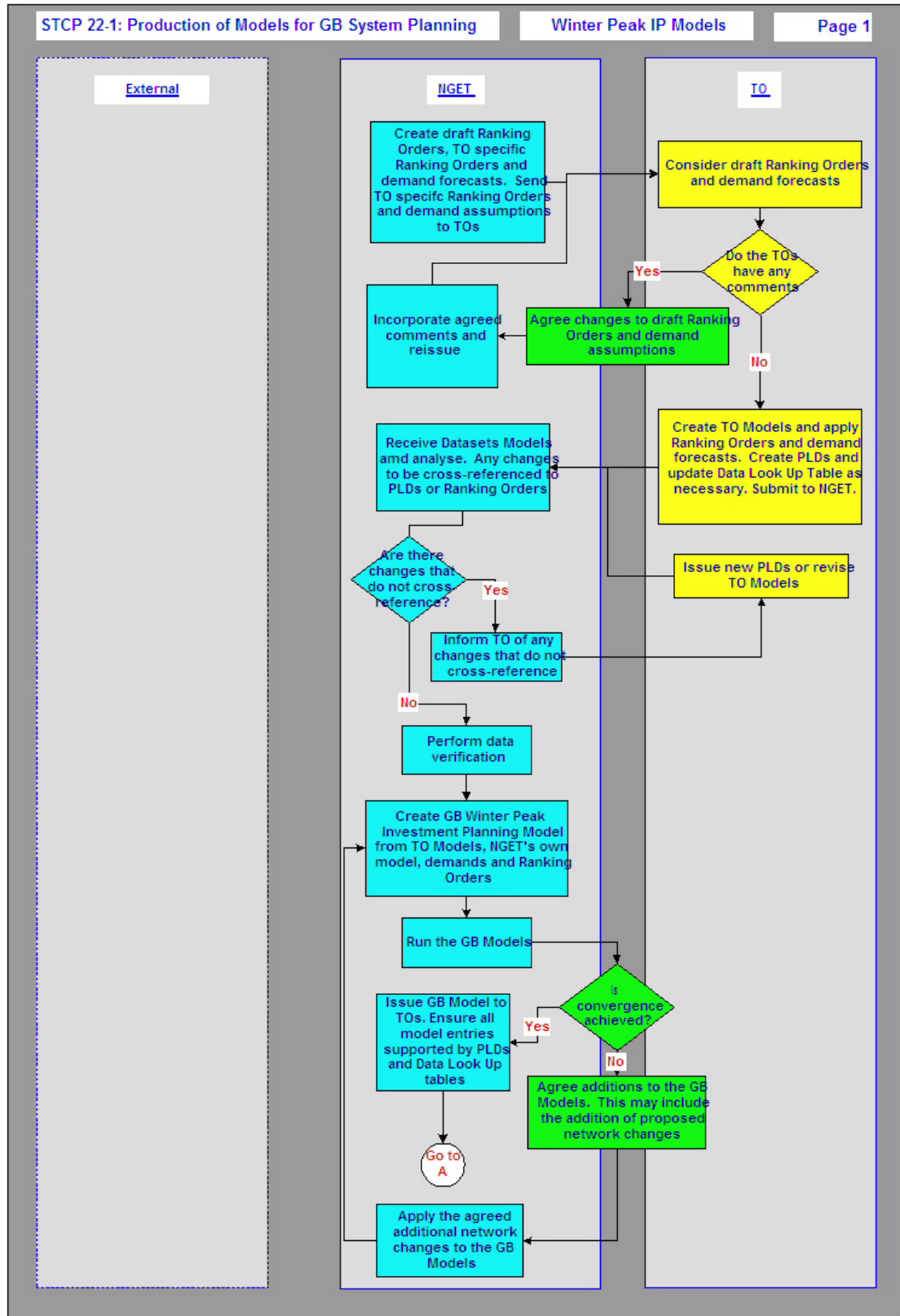
### **3.12 Exchange of Models**

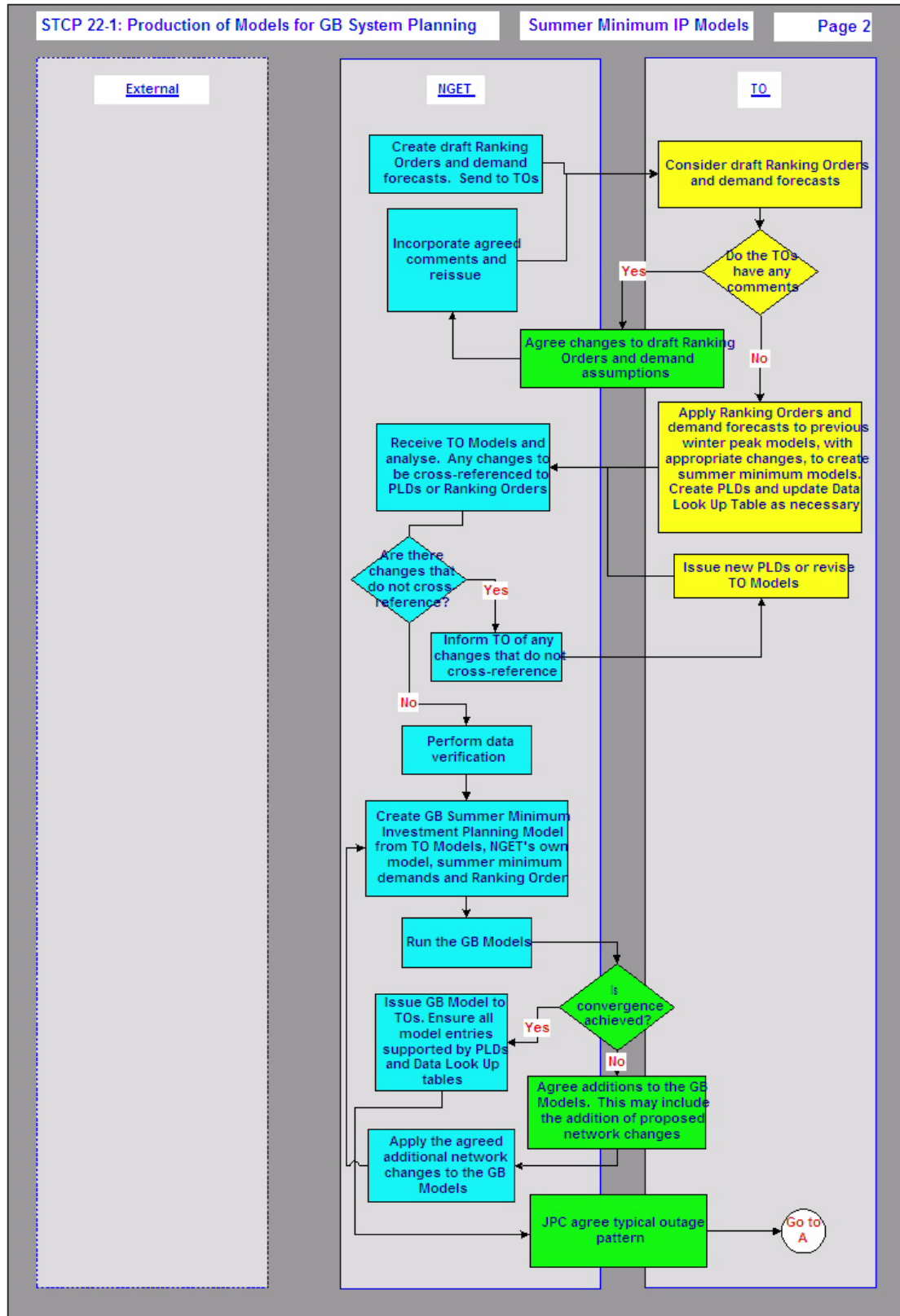
- 3.12.1 The Parties will exchange models in the formats specified in Appendix C.

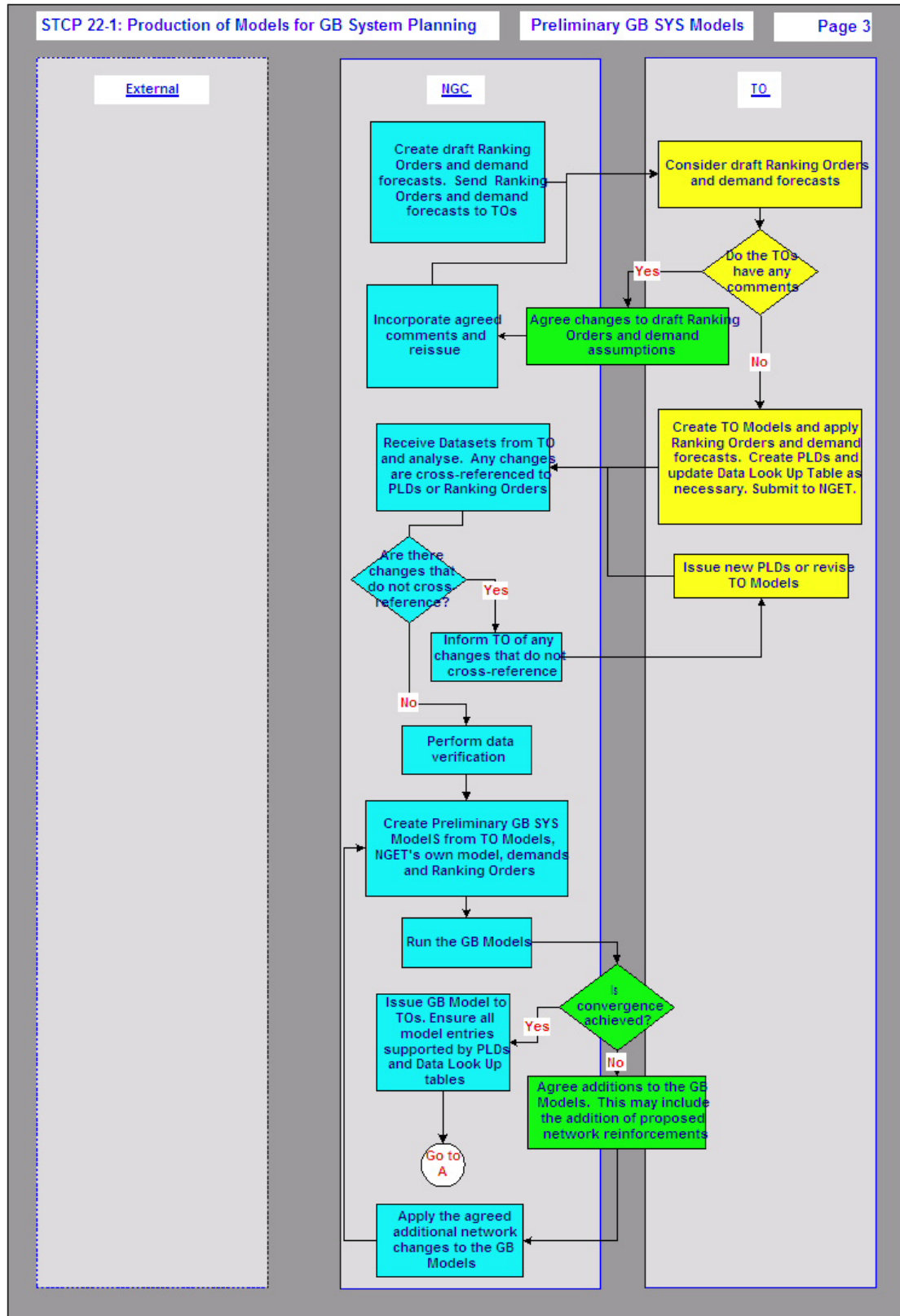
## ***Appendix A: Flow Diagram***

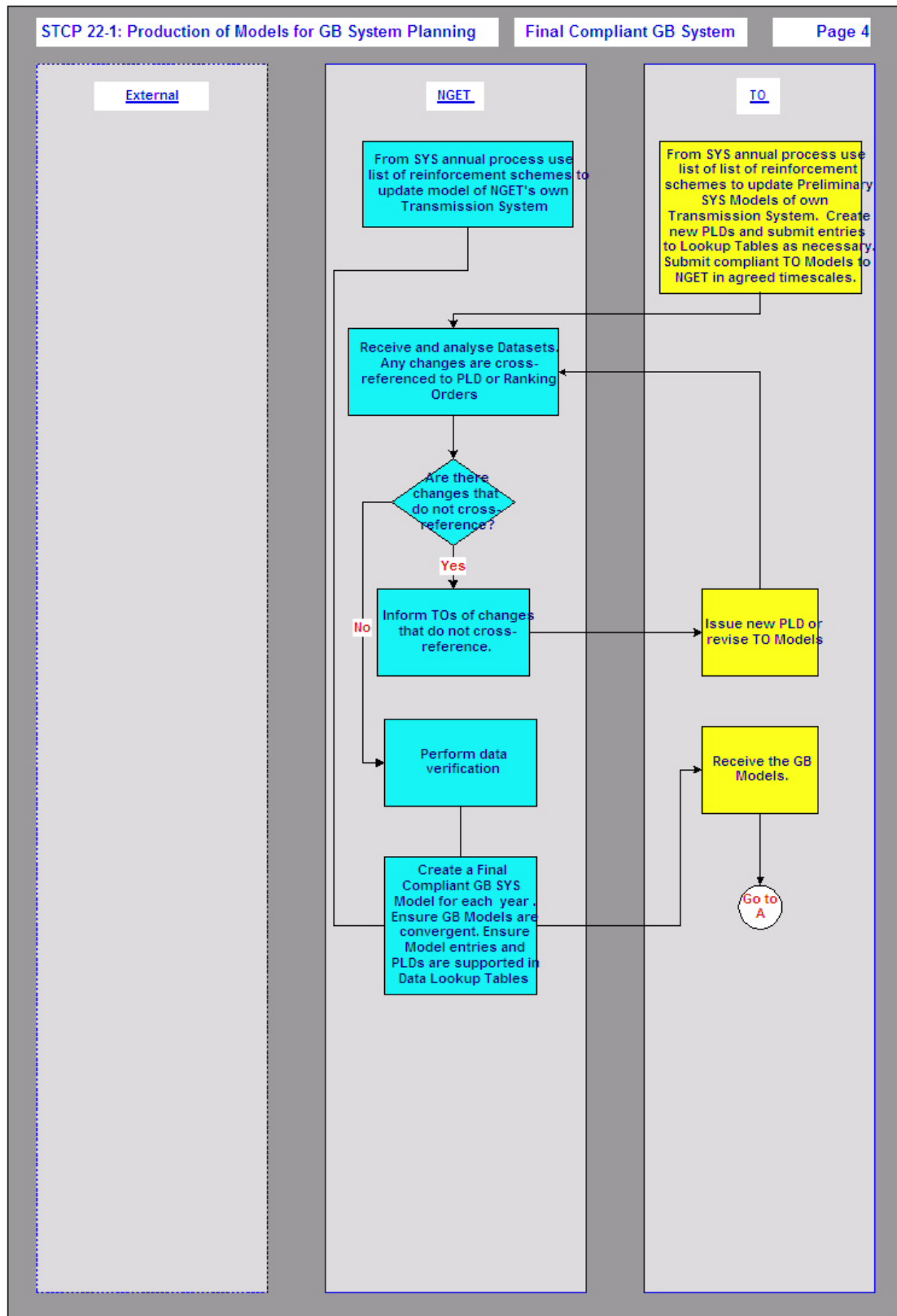
Note that the Process Diagrams shown in this Appendix are for information only. In the event of any contradiction between the process represented in this Appendix and the process described elsewhere in this STCP, then the text elsewhere in this STCP shall prevail.

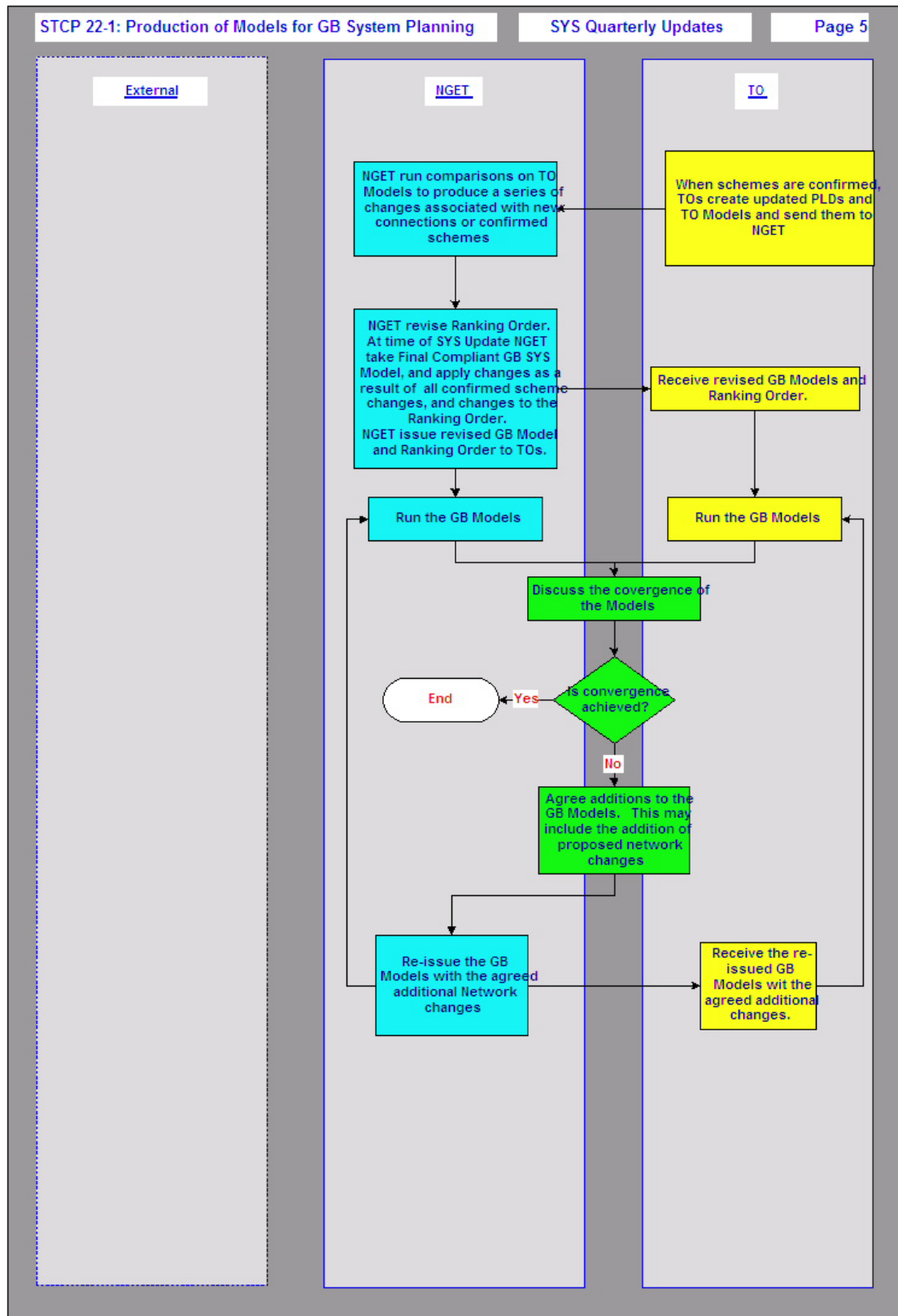


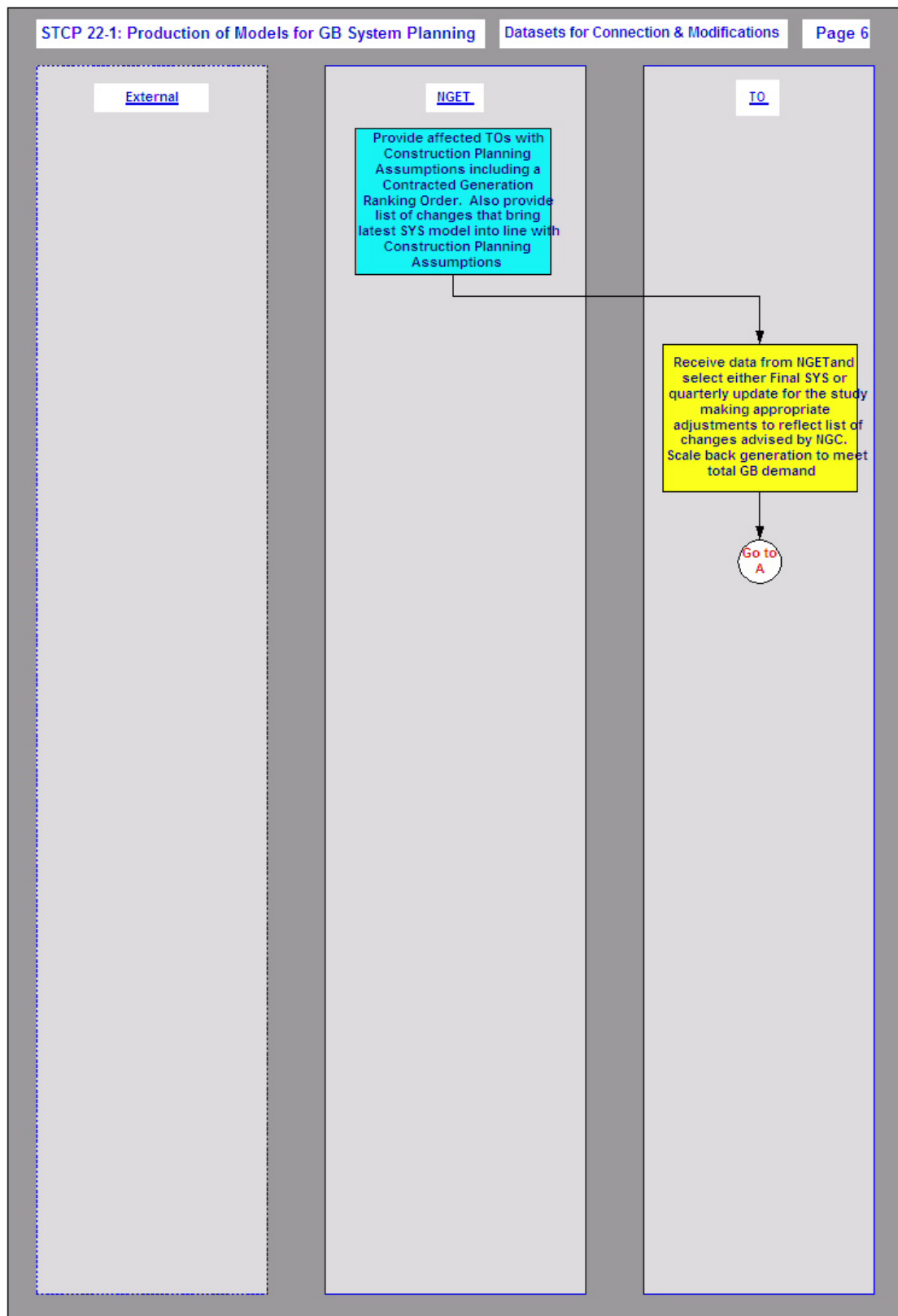


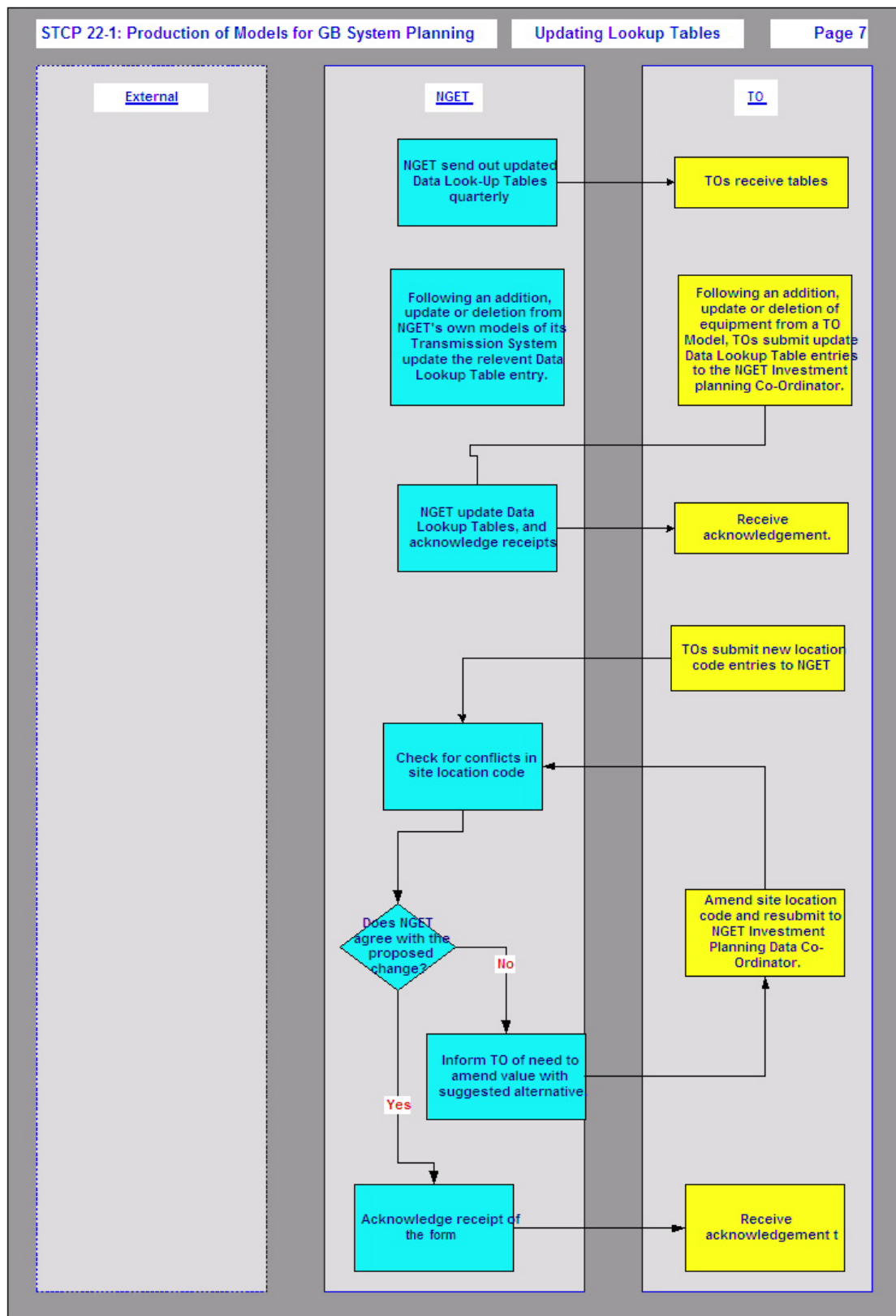


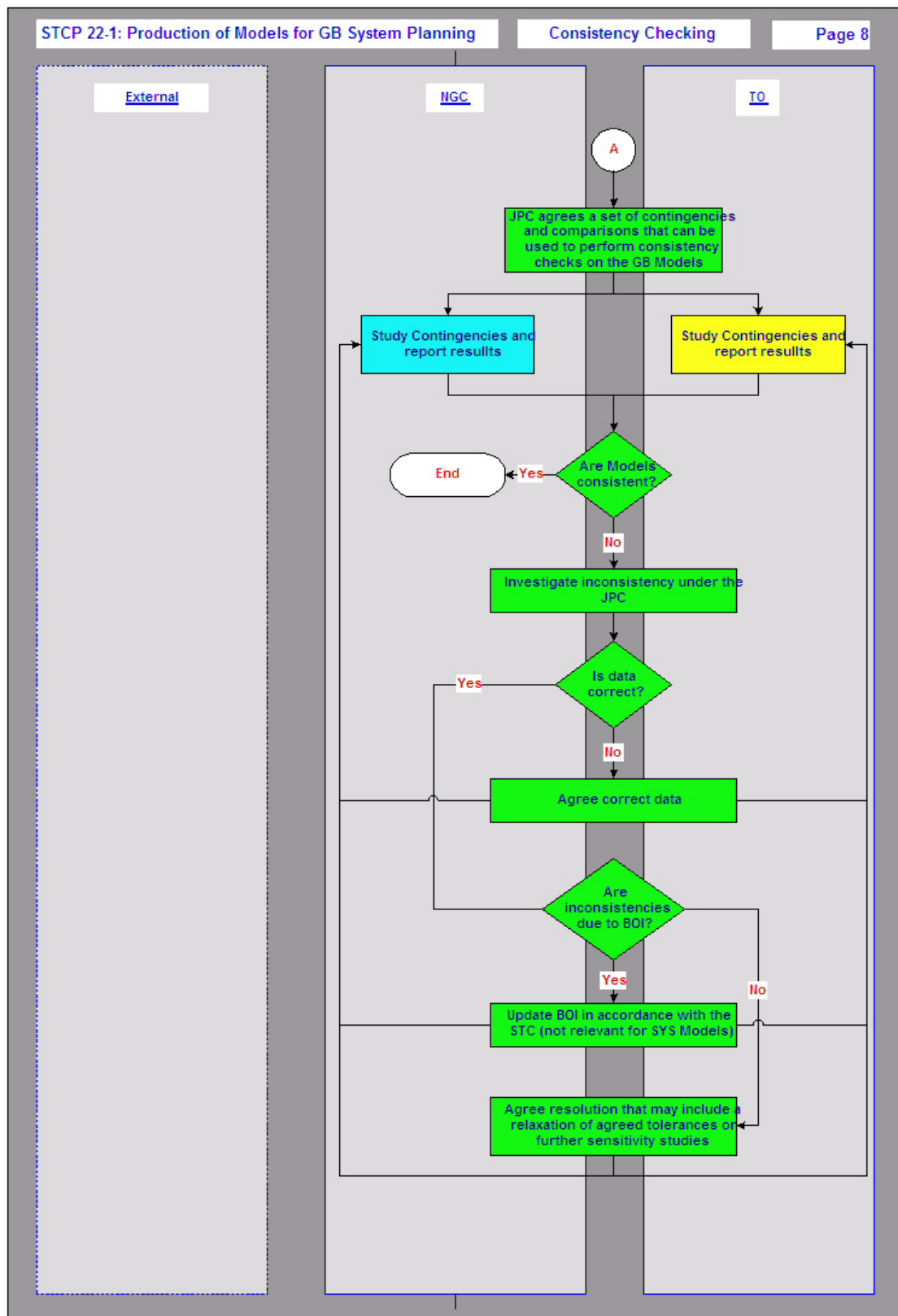




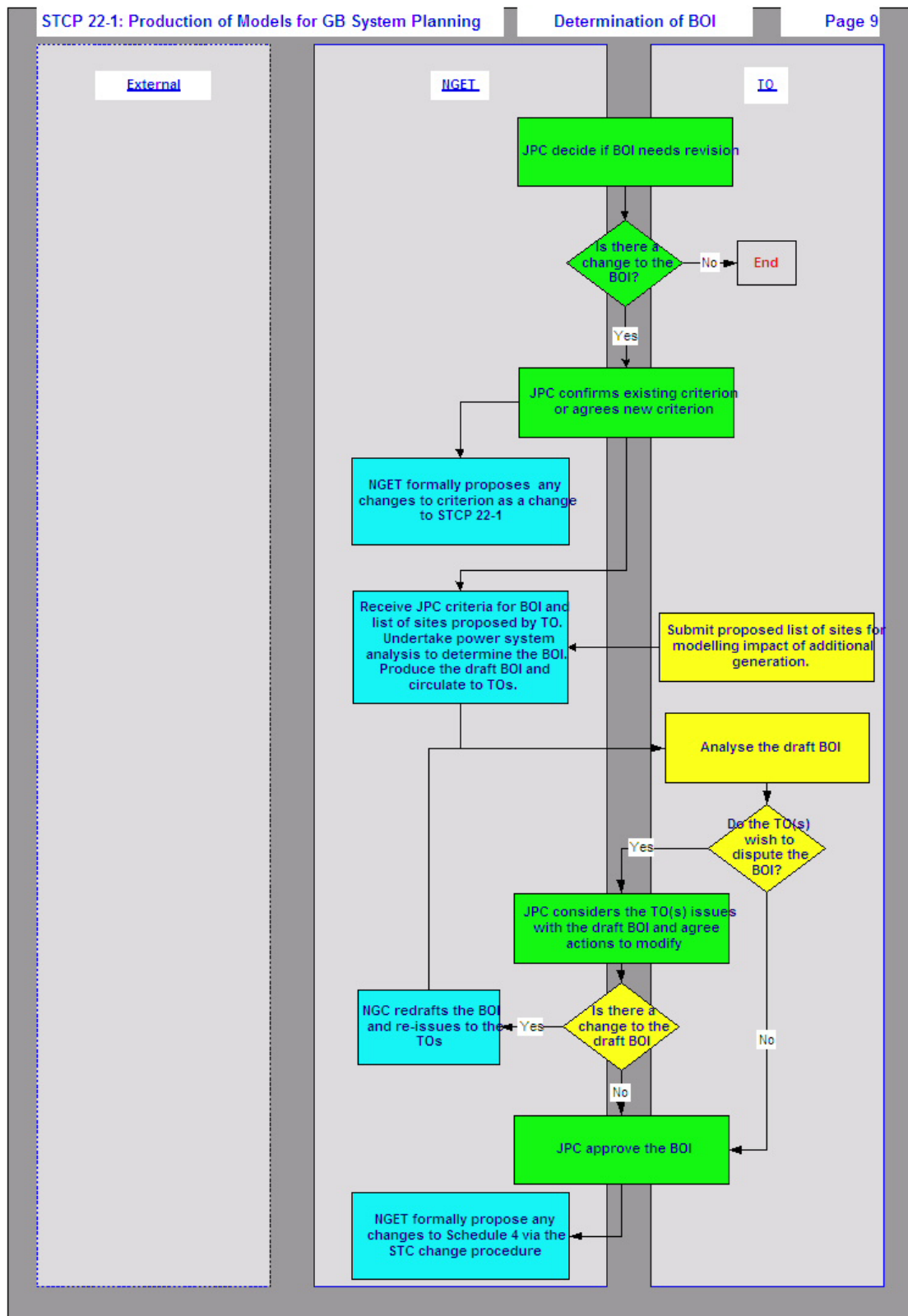












**Appendix B: Standard Forms**

Standard form for Generation Ranking Order

Rank	BM Unit ID	Station	Transmission connection node	Fuel Type	TEC /MW	Cumulative TEC /MW	Boundary of Influence Zone

Request for addition/deletion/change to Location Code Lookup table

<b>Field</b>	<b>Value</b>	<b>Description</b>
Owner		Owning company short name
Full Location Name		Full long name
PSS/e Extended Name		PSS/e name
SLC Name		Site Location Code 4-6 letters
Voltage		kV (400, 275, 132)
GBSO Modelling Zone		
GBSO Generation UoS Zone		Generation Tariff Zone
GBSO Demand UoS Zone		Demand Tariff Zone
BOI Zone		Boundary of Influence Zone
Site Type		Transmission, Connection or Generation
Status		Existing, Planning, Commissioning, Review
Remarks		Additional information
Addition/deletion/change		
Submitted By		
Submitted On		
Applicable From		
Grid Reference		ie. (033870 073040)

Shaded cells to be supplied by TO.

Request for addition/deletion /change to Circuits Lookup Table

<b>Field</b>	<b>Value</b>	<b>Description</b>
Owner		Owning company short name
PSS/e From		
PSS/e To		
PSS/e Circuit Number		
Type		ie. OHL, Cable or Composite
GBSO From		
GBSO To		
GBSO Parallel circuit identifier		
GBSO Circuit Reference		
Addition/deletion/change		
Submitted By		
Submitted On		
Applicable From		
Applicable To		May be left blank

Shaded cells to be supplied by TO.

Request for addition/deletion /change to Reactive Compensation Lookup Table

<b>Field</b>	<b>Value</b>	<b>Description</b>
Owner		Owning company short name
PSS/e From		
PSS/e To		May be left blank
PSS/e Identifier		
GBSO From		
GBSO To		May be left blank
GBSO Reference		
GBSO Unit Number		
MVAr Generation		
MVAr Absorbtion		
Compensation Type		
Connection Voltage		
Addition/deletion/change		
Submitted By		
Submitted On		
Applicable From		
Applicable TO		May be left blank

Shaded cells to be supplied by TO.

Request for addition/deletion /change to Transformers Lookup Table

<b>Field</b>	<b>Value</b>	<b>Description</b>
Owner		Owning company short name
PSS/e Node 1		
PSS/e Node 2		
PSS/e Node 3		May be left blank
PSS/e Circuit Number		
GBSO HV Node		
GBSO LV Node		
GBSO Tertiary Node		
GBSO SGT Number		
GBSO Circuit Reference		
Addition/deletion/change		
Submitted By		
Submitted On		
Applicable From		
Applicable To		May be left blank

Shaded cells to be supplied by TO.

Request for addition/deletion /change to Generation Lookup Table

<b>Field</b>	<b>Value</b>	<b>Description</b>
Owner		Owning company short name
Power Station Name		Full long name
Unit Number		
Generator Unique ID (BMU_ID)		
Plant Type		Steam, CCGT etc.
GBSO SLC Name		Site location 6 Letter Code
GBSO Connection Site		6 Letter GBSO code
GBSO Generator Transformer Code		
PSS/e Extended Name		
PSS/e Generator ID		
Voltage		Terminal voltage kV
$Q_{\min}$		Minimum reactive output MVA
$Q_{\max}$		Maximum reactive output MVA
MVA Rating		Machine rating MVA
Addition/deletion/change		
Excitation GBSO Reference		
Excitation Scottish Reference		
Governor GBSO Reference		
Governor Scottish Reference		
Submitted By		
Submitted On		
Applicable From		
Applicable TO		May be left blank

Shaded cells to be supplied by TO.

## **Appendix C: File Formats for Exchange Models**

### C.1 NGET Models

NGET will send GB Models to SPT and SHETL as a set of OPFLO, RASM and FLIP files of the following formats:

- OPFLO file format as defined in “BETTA – OPFL02 FT06 Document”, IS/9.3.4.26/FN0005, Issue 1, Draft 6, 16<sup>th</sup> August 2004
- RASM file format as defined in a fixed document to be agreed. NGET shall use reasonable endeavours to create a specification of the RASM by 15<sup>th</sup> October 2005.
- FLIP07 file format as defined in “NGT Data Exchange Format Definition for Fault Level Data”, IS/9/3/4/26/FN0009, Issue 1, 16<sup>th</sup> November 2004

### C2 SPT Models

SPT will send TO Models to NGET in PSS/E version 29 format

### C3 SHETL Models

SHETL will send TO Models to NGET in PSS/E version 25 format with a later change to version 29.



### **Appendix D: Criteria to determine Boundary of Influence**

- With a view to assessing any requirements to change the Boundary of Influence, the JPC will determine the year and planning background to be studied. The JPC shall determine the year and planning background based on JPC's opinion that selected year and planning background are likely to have the most widespread influence.
- The JPC shall determine specified nodes to both (a) add additional generation and (b) test the effect of additional generation in accordance with section 3.2. An additional generator shall be added to each specified node in turn and the changes at the other specified nodes will be recorded. The size of each generator will be proportional to the transmission voltage to which it is connecting; a 1320MW generator at 400kV, 900MW at 275kV and 450MW at 132kV.
- At the specified nodes, the difference between the existing fault levels and the switchgear rating shall be measured. At the specified nodes the increase in fault level will be measured after the addition of a new generator at each of the other specified nodes. Where the new generator increases system fault levels by more than 50% of the difference at any of the other specified nodes, the site of the new generator shall be considered to be inside the Boundary of Influence.
- The thermal capacity of the interconnecting circuits profoundly affect the thermal capacity of neighbouring TOs' Transmission System, and the capacity of key internal boundaries. Typically the power flows are from north to south, so any new generator is likely to increase the flows on the circuits south of that point. Capacity on interconnecting/boundary circuits can be expected to be used to their maximum. Hence all nodes in the SHETL area shall either be (i) deemed to be within the SHETL Boundary of Influence to SPT, or shall be recognised that a Construction Application at these nodes would otherwise materially affect SPT's Transmission System and that NGC should therefore send SPT relevant parts of Construction Planning Assumptions under Section D Part Two, paragraph 3.2 of the STC Outages of some boundary circuits and near-boundary circuits, typically including Outages on those circuits to the south of the boundary, will be modelled to measure the impact of new generators at the specified nodes to the south of a TO-TO and TO~NGC boundary. Changes in thermal loading will be apparent on each interconnecting circuit. Changes of less than <5% in MW flows on the interconnecting circuits will not be regarded as having a significant impact. Otherwise the site of the generator shall be considered to be within the Boundary of Influence.
- Voltage impacts tend to be local, and are thus likely to fall within any Boundary of Influence defined by the above two more significant parameters of Thermal Capacity and fault levels. To confirm this, voltage will be measured during the initial studies to assess fault level and thermal impact.
- The additional generators will be set to maximum MVA<sub>r</sub> export at each of the specified nodes. The changes in Transmission System voltage will be recorded at the other specified nodes. Subject to agreement by the Parties, and assuming that the voltage effects are more localised than thermal or fault level effects as expected, the voltage assessment will then NOT form part of the enduring process to determine the Boundary of Influence.
- The JPC may agree a different set of specified nodes at which generators of the sizes specified above may be placed in turn. These additional generators may be either synchronous or non-synchronous. The TOs will agree that the impact of stability on agreed specified generating units within the TOs' Transmission Areas will be measured. The impact of stability shall be measured by considering the decrement of transfer capability between the SHETL and SPT Transmission Areas, and between the SPT and NGC Transmission Areas as a result of stability considerations. A decrement of capability of less than 5% of the boundary value will not be considered as having a significant impact.

## ***Appendix E: Abbreviations and Definitions***

### ***Abbreviations***

TO	Transmission Owner
SHETL	Scottish Hydro-Electric Transmission Ltd.
SPT	SP Transmission Ltd
GB SQSS	GB Security and Quality of Supply Standards
SYS	Seven Year Statement

### ***Definitions***

#### **STC definitions used:**

Transmission System  
Construction Planning Assumptions  
GB Transmission System  
NGET  
Seven Year Statement  
Transmission Owner  
Transmission Investment Plan

#### **CUSC definitions used:**

Connection Offer

#### **Definition used from other STCPs:**

Joint Planning Committee (JPC) - STCP 16-1  
Investment Planning Study Guidelines – STCP 16-1  
SYS Study Guidelines – STCP 20-1