

IGEM/TD/101 Edition 2
Communication 1740

Adoption of pipe systems by a GT – management of UIP activities



*Founded 1863
Royal Charter 1929
Patron: Her Majesty the Queen*

IGEM/TD/101 Edition 2
Communication 1740

Adoption of pipe systems by a GT – management of UIP activities



Price Code: C3S
© The Institution of Gas Engineers and Managers

IGEM House
26-28 High Street
Kegworth
Derbyshire, DE74 2DA
Tel: 0844 375 4436
Fax: 01509 678198

Email: general@igem.co.uk



Documents

Document Sharing Hub

Copyright © 2009, IGEM. All rights reserved
Registered charity number 214001

All content in this publication is, unless stated otherwise, the property of IGEM. Copyright laws protect this publication. Reproduction or retransmission in whole or in part, in any manner, without the prior written consent of the copyright holder, is a violation of copyright law.

ISBN 978 1 905903 15 3

ISSN 0367 7850

Published by the Institution of Gas Engineers and Managers

Previous Publications:

Communication 1674 (2002) – 1st Edition

For information on other IGEM Standards please visit our website, www.igem.org.uk

CONTENTS

SECTION		PAGE
1	Introduction	1
2	Scope	3
3	Engineering requirements hierarchy	4
4	Pipeline adoption criteria	5
5	Adoption processes	6
	• 5.1 Purpose	6
	• 5.2 Initial process for each adoption model	6
	• 5.3 System to be adopted by the upstream GT	6
	• 5.4 System to be adopted by a GT other than the upstream GT – UIP acting as an Agent for the adopting GT	7
	• 5.5 System to be adopted by a GT other than the upstream GT – UIP not acting as an Agent for the adopting GT	7
6	Detailed Design	12
	• 6.1 Purpose	12
	• 6.2 Planning	12
	• 6.2.1 General	12
	• 6.2.2 Site plans	12
	• 6.3 Demand details	13
	• 6.3.1 Details of consumers	13
	• 6.3.2 Non-standard consumption	14
	• 6.3.3 Interruptible demands	14
	• 6.3.4 Demand assignment	14
	• 6.3.5 Phasing of demands	14
	• 6.3.6 Further demand	14
	• 6.4 Pressures	14
	• 6.4.1 Source pressures	14
	• 6.4.2 Specified pressures	14
	• 6.4.3 Design minimum pressure	15
	• 6.5 Design Method	15
	• 6.5.1 General	15
	• 6.5.2 Sizing of services	15
	• 6.5.3 Sizing of mains networks	15
	• 6.5.4 Pipe data	15
	• 6.5.5 Demand data	15
	• 6.5.6 Altitude	15
	• 6.6 Security of supply	16
	• 6.7 Planning of construction	16
	• 6.7.1 Services	16
	• 6.7.2 Mains	16
	• 6.8 PRIs on Networks	17
	• 6.8.1 General	17
	• 6.8.2 Design parameters	17
	• 6.9 Design validation and review	18
	• 6.10 Design records	18

7	Construction	19
•	7.1 Purpose	19
•	7.2 Method statements	19
•	7.3 Programme of works	19
•	7.4 Connections to the Network	19
•	7.4.1 Mains and services	19
•	7.4.2 Pressure regulating installations	20
•	7.5 Safe control of operations	20
•	7.5.1 Scope	20
•	7.5.2 Routine and Non-routine operations	20
•	7.5.3 Roles and competency of individuals to undertake Routine and Non-routine operations	20
•	7.6 Records	21
•	7.6.1 General	21
•	7.6.2 Records required by the adopting GT prior to planned connection date	21
•	7.6.3 Completion file requirements	22
8	Variation procedure	23
•	8.1 Purpose	23
•	8.2 General	23
•	8.2.1 Pre-construction	23
•	8.2.2 Compliance checks	23
•	8.2.3 Management	23
•	8.3 Variations from validated submission	23
•	8.3.1 General	23
•	8.3.2 Minor on-site variations	24
•	8.3.3 Major on-site variations	24

APPENDIX

1	Glossary, acronyms, abbreviations, symbols and units	25
2	References	27
3	Detailed design	30
4	Typical programme of works (whereabouts)	33
5	Example inspection form	34
6	Variations procedure	35
7	Legislation	37
8	Materials	39

FIGURE

1	Engineering requirements hierarchy	4
2	Design, construction and adoption process – system to be adopted by the upstream GT	9
3	Design, construction and adoption process – system to be adopted by a GT other than the upstream GT (UIP acting as an agent of adopting GT)	10
4	Design, construction and adoption process – system to be adopted by a GT other than the upstream GT (UIP not acting as an agent of the adopting GT)	

SECTION 1 : INTRODUCTION

1.1 IGEM/TD/101 Edition 2 supersedes IGE/TD/101 Edition 1, Communication 1674, which is obsolete.

1.2 This Standard has been drafted by an Institution of Gas Engineers and Managers (IGEM) Panel, appointed by IGEM's Gas Transmission and Distribution Committee, and has been approved by IGEM's Technical Co-ordinating Committee on behalf of the Council of IGEM.

1.3 This Standard sets down the minimum management requirements for the laying of newly constructed Natural Gas mains and services (pipelines) including associated installations, for example a pressure regulating installation (PRI), having a maximum operating pressure (MOP) of 7 bar, for adoption by a gas transporter (GT). Their use is intended primarily for Great Britain (GB), although the principles may be applied in other countries.

Note: The laying of such pipelines is, generally, carried out by a utility infrastructure provider (UIP).

1.4 IGE/TD/101 Edition 1 was drafted by an industry working group comprising the Association of Independent Public Gas Transporters (now the Association of Independent Gas Transporters (AIGT), Transco (now National Grid plc) and the Institution of Gas Engineers (now IGEM). This Edition 2 reflects changes in practices and terminology, and has been prepared by IGEM's Panel comprising representatives of District Network Operators, AIGT, independent gas transporters, Society of British Gas Industries (SBGI for UIPs) and consultants with input from the Gas Industry Registration Advisory Panel (GIRSAP).

1.5 This Standard is intended to supplement, but not amend, abridge or override, any legislation or technical standards referenced herein.

Note: This means, for example, the Pipelines Safety Regulations (PSR) take precedence over this Standard in the unlikely event of contradiction or difference.

1.6 This Standard makes use of the terms "should", "shall" and "must" when prescribing particular requirements. Notwithstanding Sub-Section 1.9:

- the term "should" prescribes a requirement which, it is intended, will be complied with unless, after prior consideration, deviation is considered to be acceptable
- the term "shall" prescribes a requirement which, it is intended, will be complied with in full and without deviation
- the terms "must" identifies a requirement by law in GB at the time of publication.

Such terms may have different meanings when used in legislation, or health and safety executive (HSE) Approved Codes of Practice (ACoPs) or guidance, and reference needs to be made to such statutory legislation or official guidance for information on legal obligations.

Copyright Institution of Gas Engineers & Managers

- 1.7 The primary responsibility for compliance with legal duties rests with the employer. The fact that certain employees, for example "responsible engineers", are allowed to exercise their professional judgement does not allow employers to abrogate their primary responsibilities. Employers must:
- have done everything to ensure, so far as is reasonably practicable, that there are no better protective measures that can be taken other than relying on the exercise of professional judgement by "responsible engineers"
 - have done everything to ensure, so far as is reasonably practicable, that "responsible engineers" have the skills, training, experience and personal qualities necessary for the proper exercise of professional judgement
 - have systems and procedures in place to ensure that the exercise of professional judgment by "responsible engineers" is subject to appropriate monitoring and review
 - not require "responsible engineers" to undertake tasks which would necessitate the exercise of professional judgement that is beyond their competence. There should be written procedures defining the extent to which "responsible engineers" can exercise their judgment. When "responsible engineers" are asked to undertake tasks that deviate from this, they should refer the matter for higher review.
- 1.8 It is now widely accepted that the majority of accidents in industry generally are in some measure attributable to human as well as technical factors in the sense that actions by people initiated or contributed to the accidents, or people might have acted better to avert them.
- It is therefore necessary to give proper consideration to the management of these human factors and the control of risk. To assist in this, it is recommended that due cognisance be taken of HSG48.
- 1.9 Notwithstanding Sub-Section 1.6, this Standard does not attempt to make the use of any method or specification obligatory against the judgement of the responsible engineer. Where new and better techniques are developed and proved, they should be adopted without waiting for modification to this Standard. Amendments to this Standard will be issued when necessary, and their publication will be announced in the Journal of IGEN and other publications as appropriate.
- 1.10 Requests for interpretation of this Standard in relation to matters within its scope, but not precisely covered by the current text, should be addressed to Technical Services, IGEN, 26-28 High Street, Kegworth, Derbyshire, DE74 2DA, email: technical@igem.org.uk and will be submitted to the relevant Committee for consideration and advice, but in the context that the final responsibility is that of the engineer concerned. If any advice is given by or on behalf of IGEN, this does not relieve the responsible engineer of any of his or her obligations.
- 1.11 This Standard was published in November 2009.

SECTION 2 : SCOPE

- 2.1 This Standard applies to pipelines (including associated installations) intended to convey Natural Gas, a 2nd family gas as defined by BS EN 437.

For the purposes of this Standard, the term "pipeline" means a main or a service. Where necessary, the terms "main" and "service" are used.

- 2.2 This Standard applies to new pipelines, associated installations and to disconnections and service alterations involving existing services.

Note 1: There is no intent that the Standard be applied retrospectively.

- 2.3 This Standard applies to pipelines (and associated installations) of MOP not exceeding 7 bar.

- 2.4 This Standard is intended to ensure that constructed pipelines and associated installations are suitable for adoption by a GT. It addresses the following:

- adoption criteria and process
- overall design (which also involves sufficient information being available to enable subsequent assurance of integrity and safety of the GT's system)
- detailed design review for networks (ensuring the submission is comparable with the GT's existing network)
- construction (in accordance with relevant technical standards)
- connections to live gas networks
- variation procedures
- alterations and disconnections
- fitness for purpose of materials and equipment.

Note: "Adoption" in this Standard means "vest in" as termed in the Gas Act 1986 (as amended) Part 1 Section 10.

- 2.5 All references to gas pressure are gauge pressure, unless otherwise stated.

- 2.6 Details of all legislation, standards and other publications referenced are provided in Appendix 2.

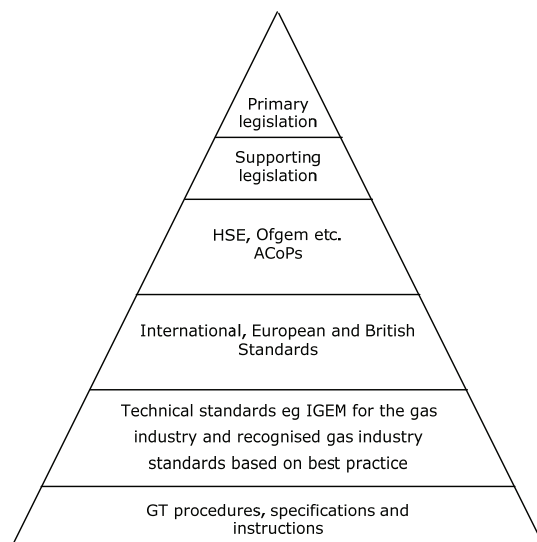
Where Standards are quoted, equivalent national and international standards, etc. equally may be appropriate.

- 2.7 Italicised text is informative and does not represent formal requirements.

- 2.8 Appendices are informative and do not represent formal requirements unless specifically referenced in the main sections via the prescriptive terms "should", "shall" or "must".

Copyright © IGH 2009

SECTION 3 : ENGINEERING REQUIREMENTS HIERARCHY



ITEM	EXAMPLES
Primary legislation	- Gas Act, Health and Safety at Work Act, etc. - New Roads and Street Works Act; Environment Act, etc.
Supporting legislation	- Construction (Design and Management) Regulations - Gas Safety (Installation and Use) Regulations - Gas Safety (Management) Regulations - Pipelines Safety Regulations - Pressure Systems (Safety) Regulations
ACoPs (HSE, Ofgem etc.)	- HSL80 - HSL81 - HSL82 - HSG47 - HSG48
International, European and British Standards	BS EN 437
Technical standards for the gas industry and recognised gas industry standards based on best practice	IGEM Standards - IGEM/TD/101 - IGEM/TD/1 Supplement 1 - IGE/TD/3 - IGE/TD/4 - IGE/TD/12 - IGE/TD/13 - IGE/GL/1 - IGE/GL/4 - IGE/GL/5 - IGE/GL/6. Industry Standards - GIS/PL2 Technical specification for polyethylene pipes and fittings for natural gas and suitable manufactured gas - NJUG Specifications for Reinstatement of Openings in Highways
GT procedures, specifications and instructions	Engineering instructions, for example lessons learned from incidents

FIGURE 1 - ENGINEERING REQUIREMENTS HIERARCHY

SECTION 4 : PIPELINE ADOPTION CRITERIA

The UIP shall satisfy the following criteria before a GT will consider the adoption of a new installation:

- for companies registered with the Gas Industry Registration Scheme (GIRS), competency of the UIP organisation in accordance with the requirements of GIRS
- for companies not registered with GIRS, the submission of documentation/evidence with any application/tender demonstrating the competency of the company, as specified by the operators of GIRS. The GT will undertake assessment of this documentation/evidence (which may include a site audit). The documentation/evidence submitted shall include:
 - quality assurance systems
 - safety management systems
 - competency of the Company
 - competency of the individuals
 - method statements.

Note: This list is not exhaustive.

- compliance with this Standard.

SECTION 5 : ADOPTION PROCESSES

5.1 PURPOSE

This section defines the overall process to be completed for the design and construction of pipelines, including associated installations, (the system) for adoption by a GT.

There are three adoption models described. Each model also shows the two alternate connection processes i.e. connection by the UIP or by the upstream GT.

5.2 INITIAL PROCESS FOR EACH ADOPTION MODEL

5.2.1 The UIP shall agree with the developer/consumer the details of the requirements for the site.

5.2.2 The UIP shall confirm with the GT the parameters for the design of any service and for any network of mains. An outline checklist of the parameters (see A3.1) should be completed.

5.2.3 An initial design assessment shall be carried out and address the following parameters:

- pressure (see Sub-Section 6.4)
- demand details (see Sub-Section 6.3)
- phasing of demand (see clause 6.3.5)
- further demand requirements (see clause 6.3.6)
- location plans (see clause 6.2.2)
- assess land ownership rights (see clause 6.2.2.1).

5.2.4 On the basis of the design parameters, the demand details for the site shall be calculated. Where the upstream GT publishes a design pressure matrix, this can be used to determine the connection pressure available. Otherwise, the demand details, together with the required plans, shall be sent to the upstream GT as a request for the connection pressures available.

5.2.5 Where required, the upstream GT will provide information on connection pressures for system extensions and for any service with a pressure drop greater than 2 mbar, together with details of any reinforcement required. The method of connection and any costs involved should be agreed between the upstream GT, the adopting GT and the UIP.

5.3 SYSTEM TO BE ADOPTED BY THE UPSTREAM GT (see Figure 2)

5.3.1 The UIP should carry out the detailed design, including design of the point of connection, in accordance with Section 6 and submit the design with any other details that the GT requires, to the GT.

5.3.2 The GT shall validate the system design and the connection design.

5.3.3 Acceptance of the GT connection quotation should initiate the GT connection process.

5.3.4 When applicable, the Easement/Servitude shall be submitted to the upstream GT prior to construction.

5.3.5 The UIP will then carry out the system construction and the connection will be made by the UIP or the GT as agreed.

- 5.3.6 Following satisfactory construction of the system, a Completion File shall be submitted to the GT. If the UIP carries out the connection, a Certification and/or Completion File, as appropriate, shall be submitted to the GT.
- 5.3.7 Irrespective of any adoption criteria that had been agreed between the UIP and the GT, responsibility for any part of the network that has been commissioned shall immediately be vested in the GT.
- 5.4 **SYSTEM TO BE ADOPTED BY A GT OTHER THAN THE UPSTREAM GT – UIP ACTING AS AN AGENT OF THE ADOPTING GT (see Figure 3)**
- 5.4.1 In this model, the UIP should be contractually recognised by the upstream GT as an agent of the adopting GT.
- 5.4.2 The UIP should carry out the detailed design, including design of the point of connection, in accordance with Section 6 and submit the design with any other details that the upstream/adopting GT requires, to the upstream/adopting GT as appropriate.
- 5.4.3 The adopting GT shall validate the system design and the upstream GT shall validate the connection design if the connection is to be carried out by the UIP.
- 5.4.4 Acceptance of the upstream GT connection quotation should initiate the upstream GT connection process.
- 5.4.5 When applicable, the Easement/Servitude shall be submitted to the upstream and/or adopting GT as appropriate, prior to construction.
- The UIP will then carry out the system construction and the connection will be made by the UIP or the upstream GT as agreed.
- 5.4.6 Following satisfactory construction of the system, a Completion File shall be submitted to the adopting GT. If the UIP carries out the connection, a Certification and/or Completion File, as appropriate, shall be submitted to the upstream GT.
- 5.4.7 Irrespective of any adoption criteria that had been agreed between the UIP and the two GTs, responsibility for any part of the system that has been commissioned shall immediately be vested in the adopting GT and the connection (irrespective of who constructed it) with the upstream GT.
- 5.5 **SYSTEM TO BE ADOPTED BY A GT OTHER THAN THE UPSTREAM GT – UIP NOT ACTING AS AN AGENT OF THE ADOPTING GT (see Figure 4)**
- 5.5.1 In this model, the UIP is not contractually recognised by the upstream GT as an agent of the adopting GT. Therefore, the adopting GT should interface between these two parties.
- 5.5.2 The UIP should carry out the detailed design, including design of the point of connection, in accordance with Section 6, and submit the design with any other details that the upstream/adopting GT requires, to the upstream/adopting GT as appropriate.
- 5.5.3 Where the UIP wishes to make the connection, the adopting GT shall submit the design to the upstream GT for design validation and authorisation.
- 5.5.4 Easement/Servitude shall be submitted to the upstream and/or adopting GT as appropriate, prior to construction.
- 5.5.5 The adopting GT shall validate the system design.

- 5.5.6 Acceptance of the upstream GT connection quotation by the adopting GT should initiate the upstream GT connection process.
- 5.5.7 The UIP will then carry out the system construction and the connection will be made by the UIP or the upstream GT as agreed.
- 5.5.8 Following satisfactory construction of the system, a Completion File shall be submitted to the adopting GT.
- 5.5.9 Irrespective of any adoption criteria that had been agreed between the UIP and the two GTs, responsibility for any part of the system that has been commissioned shall immediately be vested in the adopting GT and the connection (irrespective of who constructed it) with the upstream GT.

.....

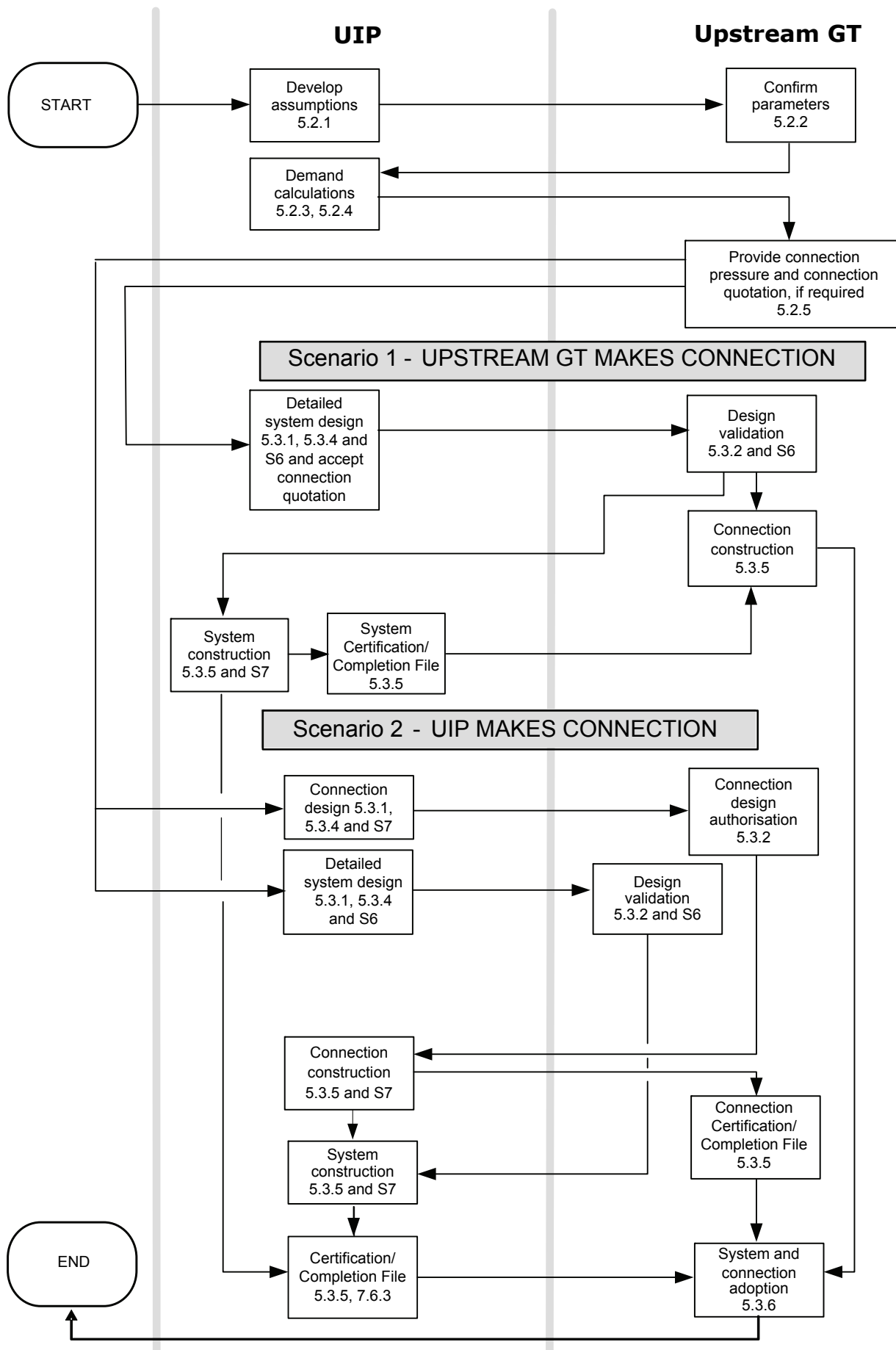


FIGURE 2 - DESIGN, CONSTRUCTION AND ADOPTION PROCESS – SYSTEM TO BE ADOPTED BY THE UPSTREAM GT