Seawater Desalination Code

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# Table of Contents

**Introduction**  
IN-1

**General Conditions**  
GC-1

- **GC.1** Introduction  
- **GC.2** Objective  
- **GC.3** Scope  
- **GC.4** Duty of Good Faith  
- **GC.5** Unforeseen Circumstances  
- **GC.6** Suspension of the SWDC provisions  
- **GC.7** Data and Notices  
- **GC.8** Confidentiality  
- **GC.9** Communication  
- **GC.10** Disputes  
- **GC.11** The Review Panel  
- **GC.12** Illegality and Partial Invalidity  
- **GC.13** SWDC Amendment  
- **GC.14** Derogation Process  
- **GC.15** Code Interpretation  
- **GC.16** Transitional Provisions

**Planning Code**  
PC-1

- **PC.1** Introduction  
- **PC.2** Objective  
- **PC.3** Scope  
- **PC.4** Planning Data  
- **PC.5** Total Forecast  
- **PC.6** System Studies  
- **PC.7** Ten Year Statement  
- **PC.8** Forecast data change  
- **PC.9** Planning criteria and standards  
- **PC.10** Validation and verification of planning data  
- **PC.11** Data Confidentiality  
- **PC-Appendix 1** Flowchart for Planning procedures and time table for main planning actions

**Connection Code**  
CC-8

- **CC.1** Introduction  
- **CC.2** Objective  
- **CC.3** Scope  
- **CC.4** Connection Point  
- **CC.5** Connection Procedure  
- **CC.6** Connection Activities
CC.7 Safety rules
CC.8 Environmental issues
CC.9 Connection of PCC
CC-Appendix 1 Types of data
CC-Appendix 2 Flowchart for Connection Procedure
CC-Appendix 3 Equipment Configuration for the Connection Point between each Water Producer’s Facility and the DWTS
CC-Appendix 4 Equipment Configuration for the Connection Point between each WDSO’s Facility and the DWTS
CC-Appendix 5 Technical Requirements for the Water Metering System
CC-Appendix 6 Technical Requirements for the Online Monitoring System and Sample Point

Operation Code 1: Operational Planning
OC1.1 Introduction
OC1.2 Objective
OC1.3 Scope
OC1.4 One (1) Year Operating Plan
OC1.5 Three (3) Year Operating Plan

Operation Code 2: Safety Co-ordination Procedure
OC2.1 Introduction
OC2.2 Objective
OC2.3 Scope
OC2.4 Safety Co-ordination Procedure

Operation Code 3: Incident and Incident Reporting
OC3.1 Introduction
OC3.2 Objective
OC3.3 Scope
OC3.4 Incidents
OC3.5 Significant Incident
OC3-Appendix 1 Incidents Reporting

Operation Code 4: Water Quality
OC4.1 Introduction
OC4.2 Objective
OC4.3 Scope
OC4.4 Transmitted Water Quality
OC4.5 Procedures for Monitoring
OC4.6 Procedures for Sampling
OC4.7 Data Storage and Reports
OC4.8 Water Quality Failure
OC4-Appendix 1 Transmitted Water Quality
OC4-Appendix 2 Online Monitoring System and Sampling
**Operation Code 5: Transmission System Disruption**

<table>
<thead>
<tr>
<th>Code</th>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>OC5.1</td>
<td>Introduction</td>
<td>OC-27</td>
</tr>
<tr>
<td>OC5.2</td>
<td>Objective</td>
<td>OC-27</td>
</tr>
<tr>
<td>OC5.3</td>
<td>Scope</td>
<td>OC-27</td>
</tr>
<tr>
<td>OC5.4</td>
<td>TSD Procedure</td>
<td>OC-27</td>
</tr>
<tr>
<td>OC5.5</td>
<td>Emergency Plan and Manual of Emergency Operating Procedures</td>
<td>OC-28</td>
</tr>
<tr>
<td>OC5.6</td>
<td>Transmitted Water Demand</td>
<td>OC-29</td>
</tr>
</tbody>
</table>

**Operation Code 6: Start-up and Shutdown Procedures**

<table>
<thead>
<tr>
<th>Code</th>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>OC6.1</td>
<td>Introduction</td>
<td>OC-31</td>
</tr>
<tr>
<td>OC6.2</td>
<td>Objective</td>
<td>OC-31</td>
</tr>
<tr>
<td>OC6.3</td>
<td>Scope</td>
<td>OC-31</td>
</tr>
<tr>
<td>OC6.4</td>
<td>Start - up and Shutdown Procedures</td>
<td>OC-31</td>
</tr>
<tr>
<td>OC6.5</td>
<td>Operating and Maintenance Manual</td>
<td>OC-32</td>
</tr>
<tr>
<td>OC6.6</td>
<td>Following Operations</td>
<td>OC-32</td>
</tr>
</tbody>
</table>

**Water Metering Code**

<table>
<thead>
<tr>
<th>Code</th>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>WM.1</td>
<td>Introduction</td>
<td>WM-1</td>
</tr>
<tr>
<td>WM.2</td>
<td>Objective</td>
<td>WM-1</td>
</tr>
<tr>
<td>WM.3</td>
<td>Scope</td>
<td>WM-1</td>
</tr>
<tr>
<td>WM.4</td>
<td>Other metering requirements</td>
<td>WM-1</td>
</tr>
<tr>
<td>WM.5</td>
<td>Water meter data</td>
<td>WM-2</td>
</tr>
<tr>
<td>WM.6</td>
<td>Technical requirements of the water meters and the water metering system</td>
<td>WM-2</td>
</tr>
<tr>
<td>WM.7</td>
<td>Water metering system</td>
<td>WM-2</td>
</tr>
<tr>
<td>WM.8</td>
<td>Commissioning of the water metering system</td>
<td>WM-3</td>
</tr>
<tr>
<td>WM.9</td>
<td>Periodic Calibration and Testing of water meters</td>
<td>WM-3</td>
</tr>
<tr>
<td>WM.10</td>
<td>Suspected metering errors</td>
<td>WM-3</td>
</tr>
<tr>
<td>WM.11</td>
<td>Adjustment, repair, replacement or recalibration of Water Metering System</td>
<td>WM-4</td>
</tr>
<tr>
<td>WM.12</td>
<td>Adjustments to Water Metering System</td>
<td>WM-4</td>
</tr>
<tr>
<td>WM.13</td>
<td>Water Meter Data security and registration</td>
<td>WM-5</td>
</tr>
<tr>
<td>WM.14</td>
<td>Water Meter Data exchange</td>
<td>WM-6</td>
</tr>
<tr>
<td>WM.15</td>
<td>Water Meter Data Storage</td>
<td>WM-7</td>
</tr>
</tbody>
</table>

**Scheduling and Dispatch Code**

<table>
<thead>
<tr>
<th>Code</th>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>SDC.1</td>
<td>Introduction</td>
<td>SDC-1</td>
</tr>
<tr>
<td>SDC.2</td>
<td>Objective</td>
<td>SDC-1</td>
</tr>
<tr>
<td>SDC.3</td>
<td>Scope</td>
<td>SDC-1</td>
</tr>
<tr>
<td>SDC.4</td>
<td>Load Dispatch centre (LDC)</td>
<td>SDC-1</td>
</tr>
<tr>
<td>SDC.5</td>
<td>Information To Be Used</td>
<td>SDC-2</td>
</tr>
<tr>
<td>SDC.6</td>
<td>Availability Declaration</td>
<td>SDC-2</td>
</tr>
<tr>
<td>SDC.7</td>
<td>Demand Notice</td>
<td>SDC-4</td>
</tr>
<tr>
<td>SDC.8</td>
<td>Scheduling</td>
<td>SDC-4</td>
</tr>
</tbody>
</table>
SDC.9  Dispatch
SDC-Appendix 1  Operating characteristics
Glossary and Definitions
GD-Appendix 1  List of Abbreviation
GD-Appendix 2  Overview Incident Criteria
INTRODUCTION

1. This Seawater Desalination Code of the Kingdom of Saudi Arabia (SWDC) has been prepared pursuant to:
   (a) Electricity Law of 22 November 2005, the Charter of the Electricity and Cogeneration Regulatory Authority under Council of Ministers Resolution No 154 of 21 May 2007; and
   (b) the Licence held by the Desalinated Water Transmission System Operator (DWTSO).

2. This SWDC sets out the planning, connection and operating procedures and principles governing the DWTSO’s relationship with each User of the Desalinated Water Transmission System (DWTS), and specifies the day-to-day procedures for planning, connection and operational purposes, and covers both normal and exceptional circumstances.

3. This SWDC has been designed so as:
   (a) to permit the development, operation and maintenance of an efficient, co-ordinated and economical DWTS; and
   (b) to facilitate and encourage competition between Desalinated Water Producers (DWP) in the Seawater Desalination Industry.

4. This SWDC covers the transmission of:
   (a) Desalinated Water from each Seawater Desalination Plant; and
   (b) Water from each Non-Seawater Plant (NSP),
through the DWTS, and up to and including each Connection Point between the DWTS and each Water Distribution System (WDS).

5. This SWDC also covers the distribution of Desalinated Water from each Seawater Desalination Plant up to and including each Connection Point between each Seawater Desalination Plant and the Plant Connected Customer (PCC).

6. This SWDC:
   (a) establishes the rules and procedures necessary to govern the development and operation of the Seawater Desalination Industry, including, rules and procedures for the:
      (i) planning of development in relation to the DWTS;
      (ii) operation of each Seawater Desalination Plant and the DWTS;
      (iii) setting up and maintenance of each Connection Point;
      (iv) production of Desalinated Water by the process of seawater desalination;
      (v) transmission of Transmitted Water to each WDS;
      (vi) delivery of Water from each NSP to the DWTS;
      (vii) delivery of Desalinated Water to each PCCs; and
(viii) scheduling and dispatch of Desalinated Water from each Seawater Desalination Plant;

(b) specifies the roles, obligations and responsibilities of the DWTSO and each User;

(c) facilitates the continued development of a secure, reliable and safe Seawater Desalination Industry;

(d) is prepared on a non-discriminatory basis in order to protect the interests of the DWTSO, each User and consumers of Transmitted Water; and

(e) is designed to encourage local and foreign investment and participation in the Seawater Desalination Industry and promote competition thereafter.

7. This SWDC is divided into the following sections:

(a) the General Conditions, which contain provisions that are of a general application to all provisions of this SWDC;

(b) the Planning Code, which provides for the supply of certain information needed for the planning and development of the DWTS;

(c) the Connection Code, which specify the minimum technical, design and operational criteria for all connections to the DWTS and for the DWTS at those Connection Points;

(d) the Operating Code, which is split into a number of codes, and which sets out the procedures required for effective cooperation between the DWTSO and each User. In particular, it deals with:

(i) operational planning;

(ii) safety co-ordination procedure;

(iii) incident reporting;

(iv) water quality;

(v) transmission system disruption; and

(vi) start-up and shut down procedures;

(c) the Water Metering Code; and

(f) the Scheduling and Dispatch Code, which sets out the procedures required to balance Transmitted Water production with demand, and to schedule each production plants’ output for transmission and dispatch.

8. This introduction is provided to each existing User as well as to each prospective User for information purposes only, and does not form part of this SWDC.

9. The term ‘DWTS’ includes every part of the DWTS, whether or not such part is connected to another part of the DWTS.

10. The term ‘DWTSO’ refers to the Person carrying on the functions of DWTS operation, whether carried out through a single entity or through a number of offices and/or locations. The DWTSO shall be responsible for setting up and
managing its internal organization to ensure compliance with its obligations under the **SWDC**.
GENERAL CONDITIONS

GC.1 INTRODUCTION

GC.1.1 These General Conditions contain provisions which are of a general application to all sections of this SWDC.

GC.1.2 The objective of these General Conditions is to ensure, to the maximum extent possible, that the various sections of this SWDC work together and work in practice for the benefit of the DWTSO and each User.

GC.2 OBJECTIVE

GC.2.1 The objective of these General Conditions is to:

(a) provide principles to enable unforeseen circumstances to be managed;
(b) define general rules regarding the communications between the DWTSO and each User and the exchange of data and information between them;
(c) specify the purpose, functions and composition of the Review Panel; and
(d) specify the general rules for interpreting the provisions of this SWDC.

GC.3 SCOPE

GC.3.1 These General Conditions apply to the DWTSO and to each User.

GC.4 DUTY OF GOOD FAITH

GC.4.1 The DWTSO and each User shall at all times in its dealings with each other act in good faith and in accordance with Good Industry Practice, relevant rules and regulations and the provisions of this SWDC.

GC.5 UNFORESEEN CIRCUMSTANCES

GC.5.1 If certain circumstances arise which have not been foreseen by the provisions of this SWDC, the DWTSO shall, to the extent reasonably practicable in the circumstances:

(a) consult each affected User in an effort to obtain a consensus on the action required; and
(b) submit any necessary proposals to each affected User for consideration.

GC.5.2 If agreement between the DWTSO and each affected User cannot be reached in the time available, the DWTSO shall in consultation with ECRA, determine the best course of action.

GC.5.3 Each User shall comply with all instructions given to it by the DWTSO or ECRA, as the case may be, following such a determination, provided that the
instructions are consistent with the then current technical parameters of the relevant User’s Facility registered under the SWDC.

GC.5.4 The DWTSO shall, as soon as reasonably practicable following the occurrence of an unforeseen circumstance, notify all relevant details thereof to the Review Panel for consideration, and shall include in the notification any relevant proposed re-drafting to deal with the unforeseen circumstances.

GC.6 SUSPENSION OF THE SWDC PROVISIONS

GC.6.1.1 The provisions of this SWDC, either in part or in whole, of this SWDC may be suspended should any abnormal conditions or emergency situations arise, pursuant to any directions given by ECRA or by the Government or the MOWE.

GC.7 DATA AND NOTICES

GC.7.1 All data and notices required under this SWDC, other than data which is the subject of a specific requirement of the SWDC as to the manner of its delivery, shall be submitted electronically or through any other means agreed upon by the relevant parties.

GC.7.2 Written notices under this SWDC shall be served either by hand delivery, registered first-class pre-paid mail, courier service or facsimile to the DWTSO or each relevant User, as the case may be.

GC.7.3 Data and notices to be provided by each User to the DWTSO shall be delivered to the specified address or addresses of the DWTSO, as notified by the DWTSO to each User upon each User first being bound by this SWDC, or to such other address or addresses as the DWTSO may notify each User from time to time.

GC.7.4 Data and notices to be provided by the DWTSO to each User shall be delivered by the DWTSO to the specified address or addresses as notified by each User to the DWTSO, or failing which, to the registered or principal office of each relevant User.

GC.8 CONFIDENTIALITY

GC.8.1 All data and other information provided by each User to the DWTSO, in accordance with the provisions of this SWDC, prior to connection, shall be treated by the DWTSO as confidential in accordance with the terms of this SWDC.

GC.8.2 All data and other information provided by each User to the DWTSO in accordance with the DWTSO’s application process, before the DWTSO makes an Offer of Connection, shall be treated by the DWTSO as confidential in accordance with the terms of this SWDC.

GC.8.3 Any data or other information made available by the DWTSO to each User or each prospective User, prior to connection or the Offer of Connection being accepted, shall be used only by the relevant User for the purpose specified by the DWTSO, and shall be treated by the relevant User as confidential in accordance with the terms of this SWDC.
GC.8.4 Unless in relation to a particular type of data where this SWDC provides an express confidentiality obligation, in which case in relation to that data that confidentiality obligation shall apply, the requirement to treat as confidential certain data and other information as provided for in this Section GC.8.4, is as follows:

(a) the DWTSO and each User, as the case may be, shall not; and
(b) the DWTSO and each User, as the case may be, shall ensure that its employees, officers, shareholders, board members or directors (together Permitted Persons) shall not, at any time, whether prior to, during or after becoming bound by this SWDC, without the prior written consent of the DWTSO or the affected User, as the case may be, divulge to any person, other than to any Permitted Person:
(c) who requires such information to enable them to properly carry out their duties under this SWDC; and
(d) provided that such Permitted Person is bound by provisions imposing confidentiality obligations equivalent to this provision, any data or information covered by this Section GC.8.

GC.8.5 The restrictions imposed by Section GC.8.4 shall not apply to the disclosure of any data or information:

(a) which is or comes into the public domain, otherwise than as a result of a breach of an undertaking of confidentiality or which is lawfully obtainable with no more than reasonable diligence from sources other than the relevant party;
(b) which is required to be disclosed:
   (i) under any relevant law;
   (ii) by any competent authority; or
   (iii) pursuant to this SWDC or any licence issued under any relevant electricity law;
(c) which is required to be disclosed by the regulations of any recognised stock exchange upon which the share capital of the relevant party is or is proposed to be from time to time listed or dealt with; or
(d) which is required to be disclosed in the course of administrative or judicial proceedings,

provided, however, that in relation to Sections GC.8.5(b) to GC.8.5(d) (other than Section GC.8.5(b) (ii)), as soon as a disclosing party learns of the disclosure requirement, and prior to making such disclosure, to the extent permitted by law or any court order, it shall notify the party whose data it is, of the requirement and the terms thereof.

GC.9 COMMUNICATION

GC.9.1 Unless otherwise specified in the SWDC, all instructions given by the DWTSO and communications (other than those relating to the submission of data and notices) between the DWTSO and each User shall take place
between identified persons agreed between the DWTSO and each User prior to connection, or such other persons as the DWTSO or each User, as the case may be, may, from time to time, notify to the other person for such purposes.

**GC.9.2** Unless otherwise specified in the SWDC, all instructions given by the DWTSO and communications (other than those relating to the submission of data and notices) between the DWTSO and each User shall be by telephone, fax, email or any other acceptable electronic means, with a facility to record messages. Such recording must be retained for at least one (1) year and shall be accepted by DWTSO and each User as evidence of those instructions or communications.

**GC.10** DISPUTES

**GC.10.1** In case of a dispute between the DWTSO and each affected User about any provision of the SWDC or any issue relating to that provision, the DWTSO and each affected User shall first endeavor to resolve such dispute through good faith negotiations.

**GC.10.2** Each party to a dispute shall designate an executive, manager and/or other senior representative to conduct such negotiation.

**GC.10.3** Any dispute or claim not resolved by such negotiation within twenty (20) Business Days of the dispute or claim arising may be referred by either party to the dispute resolution process set out in Chapter Seven of the Implementing Regulations to the Electricity Law approved by the Board of ECRA on 15/04/1427 corresponding to 13/05/2006 or any modifications to it thereafter.

**GC.10.4** While a dispute is continuing, the relevant parties shall continue to perform their respective obligations under the SWDC until such dispute has been fully and finally resolved.

**GC.11** THE REVIEW PANEL

**GC.11.1** Pursuant to its licence obligations, the DWTSO is obliged to keep the SWDC and its working under review. In order to achieve this, the DWTSO shall establish and maintain the Review Panel, which shall be a standing body carrying out the functions referred to in Section GC.11.2.

**GC.11.2** The Review Panel shall:

(a) keep the SWDC and its working under review;

(b) take appropriate action to ensure that the SWDC does not conflict with the Transmission Code;

(c) review all suggestions for amendments to the SWDC which ECRA or any User may wish to submit to the DWTSO for consideration by the Review Panel from time to time;

(d) suggest recommendations as to amendments to the SWDC that the DWTSO or the Review Panel feels are necessary or desirable, and the reasons for the recommendations;

(e) issue guidance in relation to the SWDC and its implementation, performance and interpretation when asked to do so by any User; and
(f) consider what changes are necessary to the SWDC arising out of any unforeseen circumstances referred to it by the DWTSO under Section GC.5.

GC.11.3 The Review Panel shall consist of:
(a) a chairman, who shall be a member appointed by the DWTSO, and up to 2 members appointed by the DWTSO;
(b) a member appointed by ECRA; and
(c) the following members:
   (i) 2 members appointed by the DWPs;
   (ii) 1 member appointed by the NSPOs;
   (iii) 1 member appointed by the Traders; and
   (iv) 1 member appointed by the WDSOs,
   each of whom shall be appointed pursuant to the rules issued pursuant to Section GC.11.4.

GC.11.4 The DWTSO shall prepare the rules in relation to the Review Panel, such rules to be approved by ECRA. The Review Panel shall comply at all times with these rules.

GC.11.5 The DWTSO shall consult in writing each User who may be materially affected in relation to all proposed amendments to the SWDC as required by its Licence and shall submit all proposed amendments to the SWDC to the Review Panel for discussion prior to such consultation.

GC.11.6 Each proposed amendment to the SWDC shall include an evaluation of whether the amendment would better facilitate the achievement of the SWDC objectives, as provided in the Licence issued to the DWTSO.

GC.12 ILLEGALITY AND PARTIAL INVALIDITY

GC.12.1 If any provision of the SWDC should become or be declared unlawful or partially invalid for any reason, the validity of all remaining provisions of the SWDC shall not be affected.

GC.13 SWDC AMENDMENT

GC.13.1 The Licence issued to the DWTSO contains provisions for the approval of the initial SWDC and subsequent review and revision, subject to approval by ECRA.

GC.13.2 ECRA approves the first SWDC, and the DWTSO is required to keep the SWDC under review and to consult on amendments as provided for in the Licence issued to the DWTSO, with any revisions to be approved by ECRA when submitted to it by the DWTSO.

GC.13.3 The role of the Review Panel in relation to SWDC revisions is set out in Section GC.11.

GC.13.4 Each User, the DWTSO or ECRA may propose amendments to the SWDC.
GC.14 DEROGATION PROCESS

GC.14.1 ECRA is the body which may grant a Derogation from the provisions of the SWDC. In deciding whether to grant a Derogation, ECRA may consult with the DWTSO and/or each affected User, as is considered necessary.

GC.14.2 The DWTSO or each affected User may seek a Derogation from complying with one or more provisions of the SWDC. The Derogation may be granted by ECRA to ease temporary constraints that prevent compliance and necessitate exemption.

GC.14.3 In addition, Section GC.16.4 contains transitional provisions relating to Derogations to be provided to existing plant and/or equipment that has not been designed in accordance with the provisions of this SWDC, and/or to facilitate a smooth transition to the SWDC from the existing conditions.

GC.14.4 A User seeking a Derogation shall submit a written application to the DWTSO and shall be required to justify its request in terms of both the specific circumstances and expected duration of the requested Derogation. As a minimum, the application must include the following information:

(a) detail of the applicant;
(b) relevant provision(s) of the SWDC and the required performance;
(c) description of the relevant plant and/or equipment and the nature and extent of non-compliance;
(d) description of the proposal for restoring compliance (where applicable) including details of actions to mitigate risks and restore compliance, including a proposed timetable;
(e) description of the reasonable alternative actions that have been considered; and
(f) a statement of expected duration of the non-compliance.

GC.14.5 On receipt of any request for a Derogation, the DWTSO shall promptly consider such request, by seeking expert advice/opinion on the request, if it considers it necessary, and submit the request together with its recommendations, to ECRA for a final decision.

GC.14.6 The DWTSO may itself request a Derogation and in that case will set out the equivalent information to that in Section GC.14.4 above, and shall submit the application to ECRA for a final decision. It shall include in such submission any expert advice/opinion as it considers necessary.

GC.14.7 ECRA shall consider the submission made by the DWTSO and shall decide whether a Derogation should be granted and, if so, the terms of the Derogation. In deciding on the submission, ECRA may consult with the DWTSO and/or any affected User, as it considers appropriate, to seek clarification or views on the requested Derogation.

GC.14.8 ECRA shall communicate its final decision to the DWTSO, who shall in the case of a derogation requested by a User, inform the relevant User and/or take further action, as appropriate.
GC.14.9 If a Derogation is granted, then the relevant User or the DWTSO, as the case may be, will not be obliged to comply with the applicable provision of the SWDC (to the extent and for the period of the Derogation) and the DWTSO or the User, as the case may be, shall comply with any alternative provision as set forth in the Derogation.

GC.14.10 A Derogation from the SWDC will normally have an expiry date in order to review its continued need and to assist in monitoring performance towards compliance.

GC.14.11 Every Derogation will be entered on a register maintained by ECRA for this purpose.

GC.14.12 A Derogation granted to the DWTSO and/or User shall be non-transferable. Therefore, if a non-compliant plant and/or equipment has its ownership transferred, the new owner will need to seek a new Derogation.

GC.14.13 Where a material change in circumstances has occurred, a review of any existing Derogation, and any Derogation applied for or under consideration, may be initiated by ECRA or following a request by the DWTSO or any User.

GC.15 CODE INTERPRETATION

GC.15.1 Hierarchy
In the event of any conflict between the provisions of the SWDC and:

(a) any contract or agreement between the DWTSO and a User, the provisions of the SWDC shall prevail to the extent of such conflict, unless the SWDC expressly provides otherwise; and

(b) any Electricity Law, the Charter, the Implementing Regulations or the Licence of the DWTSO, the provisions of such Electricity Law, the Charter, the Implementing Regulations or the Licence of the DWTSO shall prevail to the extent of such conflict,

and the provisions of the SWDC shall be interpreted accordingly.

GC.15.2 Glossary and definitions
Where a word or phrase that is defined in the Glossary and Definitions is more particularly defined in another section, or sub-section of the SWDC, the definition in that section, or sub-section shall prevail if there is any discrepancy. Such discrepancies, when noticed by a User or ECRA, shall be brought to the notice of the DWTSO and will be reviewed during the next review of the SWDC.

GC.15.3 Introduction, Table of Contents, Chapters and Titles
The Introduction, tables of contents, and the use of sections and titles are for ease of reference only, and shall be ignored in construing the SWDC.

GC.15.4 Singular and plural
Unless the context otherwise requires, the singular shall include the plural and vice versa. References to any one gender shall include the other gender.

GC.15.5 References
(a) Unless otherwise required, all references to a particular paragraph, sup-paragraph, appendix or schedule shall be a reference to that paragraph, sub-paragraph, appendix or schedule in or to that part of the SWDC in which the reference is made.

(b) A cross-reference to another document or part of the SWDC shall not impose any additional, further or co-existent obligation or confer any additional, further or co-existent right in the part of the text where such cross-reference is contained.

(c) Unless otherwise provided for, all references to laws, legislation, implementing regulations, directives and to standards shall be deemed to be to the then latest version.

GC.15.6 Statutory and Licence obligations
Nothing in the SWDC is intended to or shall derogate from the DWTSO’s or a User’s statutory or licence obligations.

GC.15.7 The term ‘DWTS’ includes every part of the DTWS, whether or not such part is connected to another part of the DTWS.

GC.15.8 The term ‘DWTSO’ refers to the Person carrying on the functions of DWTS operation, whether carried out through a single entity or through a number offices and/or locations. The DWTSO shall be responsible for setting up and managing its internal organization to ensure compliance with its obligations under the SWDC.

GC.16 TRANSITIONAL PROVISIONS

GC.16.1 Notwithstanding the provisions of any other part of these General Conditions, the following provisions shall apply in their place in respect of:

(a) the first establishment of the Review Panel;

(b) the appointment of Review Panel Members in respect of a class of User which does not have any persons within it at the time of the appointment;

(c) derogations to be granted in relation to the DWTS and/or plant and equipment connected to the DWTS at the time of the first approval of the SWDC; and

(d) the treatment of and population of data in the first year of operation of the SWDC.

GC.16.2 Review Panel Establishment
The first Review Panel Members will be appointed by ECRA. ECRA will, at its sole discretion, decide on the first Review Panel Members. It may do so without discussing possible members with the DWTSO and/or Users or it may discuss possible members with any or all of the DWTSO and each User. The DWTSO and each User must, if asked by ECRA, make suggestions as to the identity of possible members for the Review Panel, and respond to any other question raised by ECRA. Upon deciding who the first Review Panel Members will be, ECRA will notify the DWTSO and each User affected by the appointments.
GC.16.3 **Review Panel Member where no User**
Where there are no persons who are Users within a category of User under the SWDC, ECRA may nominate a person to be a Review Panel Member to represent the views of that category of User. The person may be from ECRA or it may be another person nominated by ECRA. As part of the nomination, that person will have its role and responsibilities set out by ECRA. That person shall owe no duty or responsibility to the DWTSO, Users and other Review Panel Members of the Review Panel arising from its role as Review Panel Member, other than to comply with the rules and procedures referred to in Section GC.11.4.

GC.16.4 **Initial Derogations**
When the SWDC is first approved, it may be that certain plant and/or equipment of the DWTSO and/or Users are not initially capable of meeting all of the requirements of the SWDC. Where the DWTSO or a User believes that its plant and/ or equipment may not meet the requirements of the SWDC, it may approach ECRA and ECRA will in its discretion, after having consulted any User of the DWTSO, as the case may be, if it decides that is necessary, and in accordance with any further procedure which ECRA may by direction publish, grant a Derogation from the SWDC requirements to the extent and for the period set out in the Derogation. It is likely that all such Derogations will be for a temporary duration.

GC.16.5 **First Year Data**
In the first year of operation of the SWDC, the submission of data in relation to periods within that first year will be dealt with pursuant to a direction or directions issued by ECRA, notwithstanding what the provisions of the SWDC state. The DWTSO and each User will comply with said directions.
PLANNING CODE

INTRODUCTION

This Planning Code is designed to ensure that each User provides the DWTSO with relevant, up-to-date and accurate planning data forecast and other planning data information to enable the DWTSO to prepare and submit to ECRA the Ten Year Statement.

This Planning Code sets out the roles and responsibilities of the DWTSO and each User in relation to the procedures to be followed by the DWTSO and each User in connection with the data exchange required for the DWTSO to prepare the Ten Year Statement.

It is envisaged that the Ten Year Statement will identify any reinforcements, improvements and/or extension programs that are required in relation to:

(a) Seawater Desalination Plants;
(b) DWTS; and
(c) Connection Points.

The planning processes relating to the development of the Seawater Desalination Industry shall be carried out by the DWTSO annually, and cover the succeeding ten (10) Years, and should provide sufficient lead times to facilitate:

(a) any necessary planning, permitting or consenting activities; and
(b) any necessary engineering, design, development, procurement and related works.

OBJECTIVE

The objectives of this Planning Code include:

(a) to provide a long term prognosis for the supply of Transmitted Water in the Kingdom of Saudi Arabia by facilitating the provision of planning data from each User to the DWTSO;
(b) to ensure that the demand, production and delivery forecast and associated planning data in connection with the Transmitted Water is provided by the each User to the DWTSO, in order for the DWTSO:
   (i) to undertake the planning and development of the DWTS in accordance with the relevant standards; and
   (ii) to maintain existing Connection Points and to facilitate new Connection Points; and
(c) to enable the DWTSO to provide to ECRA the Ten Year Statement to ensure that the long term Transmitted Water production and transmission capacity needs of the Kingdom of Saudi Arabia can be identified, planned and procured.
SCOPE

This Planning Code applies to the DWTSO and to the following Users:

(a) DWPs;
(b) NSPOs; and
(c) WDSOs.

PLANNING DATA

Forecast and other planning data

The data required by the DWTSO to prepare the Ten Year Statement shall be provided by each User to the DWTSO. Such data shall comprise:

(a) the forecast data listed in Section 0;
(b) the forecast data listed in Section 0;
(c) the forecasts data listed in Section 0; and
(d) any additional information required by the DWTSO to carry out the System Studies;

The DWTSO shall use the most up-to-date planning data available to the DWTSO relating to any future Connection Point of either the Preliminary Water Planning Data or the Committed Water Planning Data as described in the Connection Code.

WDSO demand forecasts data

By June 30 of each Year, each WDSO shall provide to the DWTSO in relation to each of its Connection Points, its best estimate of the information listed below, for each calendar month of the succeeding ten (10) Years:

(a) the daily average volume flow of Transmitted Water to be withdrawn by that WDSO from the DWTS;
(b) the peak hourly volume flow of Transmitted Water to be withdrawn by that WDSO from the DWTS; and
(c) the required water quality.

The forecast data shall be prepared by each WDSO in a standard format, such standard format to be provided by the DWTSO, having been approved by ECRA.

The demand forecast data shall be submitted to the DWTSO in hard paper copy, with an electronic copy to be provided also.

The demand forecast data shall not consider any demand reduction due to any planned or unplanned outages that may affect the DWTS.

DWP forecast data

By June 30 of each Year, each DWP shall provide to the DWTSO in relation to each of its Connection Points, its best estimate of the information listed below, for each calendar month of the succeeding ten (10) Years:

(a) the daily average volume flow of Desalinated Water to be produced by that DWP and delivered to the DWTS;
(b) the peak hourly volume flow of Desalinated Water to be produced by that DWP and delivered to the DWTS; and
(c) the water quality to be provided at the Connection Point.

The forecast data shall be prepared by each DWP in a standard format, such standard format to be provided by DWTSO, having been approved by ECRA.

The forecast data shall be submitted to the DWTSO in hard paper copy, with an electronic copy to be provided also.

The forecast data shall not consider any production or delivery reduction due to planned or unplanned outages that may affect the DWTS.

**NSPO forecast data**

By June 30 of each Year, each NSPO shall provide to the DWTSO in relation to each of its Connection Points, its best estimate of the information listed below, for each calendar month of the succeeding ten (10) Years:

(a) the daily average volume flow of Water to be delivered by that NSPO to the DWTS;
(b) the peak hourly volume flow of Water to be delivered by that NSPO to the DWTS; and
(c) the required water quality at the Connection Point.

The forecast data shall be prepared by each NSPO in a standard format, such standard format to be provided by the DWTSO, having been approved by ECRA.

The forecast shall be submitted to the DWTSO in hard paper copy, with an electronic copy to be provided also.

The forecast data shall not consider any production or delivery reduction due to planned or unplanned outages that may affect the DWTS.

**TOTAL FORECAST**

By August 31 of each Year, the DWTSO shall prepare a Total Forecast for the DWTS.

The Total Forecast shall consolidate:

(a) the forecast data submitted by each User under Sections 0, 0 and 0; and
(b) the most up-to-date data set relating to any future Connection Point of either the Preliminary Water Planning Data or the Committed Water Planning Data.

The Total Forecast shall provide the following data for each calendar month of the succeeding ten (10) Years:

(a) the daily average volume flow and peak hourly volume flow of Transmitted Water to be withdrawn at each relevant Connection Point by the WDSOs from the DTWSs;
(b) the daily average volume flow of and peak hourly volume flow of Desalinated Water to be produced by the DWP.s and delivered to the DWTS, at each relevant Connection Point;
(c) the daily average volume flow and peak hourly volume flow of Water to be delivered by the NSPOs to the DWTS, at each relevant Connection Point;

(d) the expected water quality at each Connection Point between the Seawater Desalination Plants and the DWTS and the NSPs and the DWTS, as the case may be;

(e) the expected water quality at each Connection Point between the DWTS and the WDSs;

(f) the total average daily volume flow of Transmitted Water to be withdrawn from the DWTS by all WDSOs; and

(g) the total average daily volume flow of Transmitted Water to be delivered into the DWTS by all Water Producers.

The Total Forecast shall be prepared by the DWTSO in a standard format, such standard format to be provided by the DWTSO, having been approved by ECRA.

The Total Forecast shall be submitted by the DWTSO to ECRA in three (3) hard paper copies, with an electronic copy to be provided also.

SYSTEM STUDIES

The DWTSO shall prepare and maintain an electronic network model of the DWTS. The electronic network model shall be based on technical data of the following installations:

(a) the DWTS and the storage facilities connected to the DWTS;

(b) each Seawater Desalination Plant;

(c) each NSP; and

(d) each Connection Point.

Should the DWTSO require any further data from any User in relation to preparing and maintaining the electronic network model, the DWTSO shall request such data from the relevant User, and the requested User shall provide the required data to the DWTSO within the reasonable time period provided by the DWTSO.

By September 30 of each Year, the DWTSO shall carry out the System Studies covering the next ten (10) Years based on the electronic network model of the DWTS prepared under Section 0 and considering the demand, production and delivery forecasts described in Sections 0, 0 and 0.

The System Studies shall identify:

(a) in relation to each Connection Point of the DWTS with each WDS, those periods where the insufficient capacity of the DWTS or the insufficient production or delivery of Desalinated Water by the DWP or the insufficient delivery of Water by the NSPOs, as the case may be, is expected to cause a Transmitted Water deficit;

(b) in relation to each Connection Point of the DWTS with each DWP, those periods where insufficient capacity of the DWTS or the
insufficient demand of the WDSO is expected to cause a Desalinated Water surplus;
(c) the capacity margins within the different sections of the DWTS; and
(d) the expected water quality at each Connection Point between the DWTS and the WDSOs.

The System Studies will identify any reinforcements, improvements and/or extensions programs that are required in relation to:
(a) each Seawater Desalination Plant;
(b) the DWTS; and
(c) each Connection Point.

The primary focus of the System Studies shall be on hydraulics, water quality and economics in connection with the DWTS.

**TEN YEAR STATEMENT**

By December 31 of each Year, the DWTSO shall prepare and issue the Ten Year Statement to ECRA.

The Ten Year Statement shall cover the ten (10) year period beginning January of the following year. The Ten Year Statement shall present the Total Forecast combined with the results of the System Studies.

**FORECAST DATA CHANGE**

If a DWP, NSPO or WDSO submits significant changes to its forecast data in a consecutive reporting year for the same operational year, explanation of these changes shall be given in writing by that DWP, NSPO or WDSO, as the case may be, to the DWTSO with the submission of the revised forecast data.

For the purposes of Section 0, a significant change is considered to be a change of more than ten (10) % in comparison to the data submitted in the previous year.

**PLANNING CRITERIA AND STANDARDS**

The DWTSO shall apply the DWTS planning criteria and standards for the planning and development of the DWTS and the Seawater Desalination Industry.

The planning processes in connection with the planning criteria and standards, shall be carried out annually by the DWTSO, and should provide sufficient lead times to facilitate:
(a) any necessary planning, permitting or consenting activities; and
(b) any necessary engineering, design, development, procurement and related works.

In accordance with the annual planning processes under Section 0, the planning criteria and standards shall be prepared by the DWTSO as and when required, and any amendments to the planning criteria and standards shall be approved by ECRA.
VALIDATION AND VERIFICATION OF PLANNING DATA

Without limiting Section 0, the DWTSO shall review and verify the planning data submitted to the DWTSO by each DWP, NSPO and WDSO.

Such review and verification shall be done by comparison of the planning data submitted by each DWP, NSPO and WDSO, with the results of the System Studies.

The electronic network model shall be used to process plausibility checks of the submitted planning data as against the results of the hydraulic calculations.

The DWTSO may request each DWP, NSPO or WDSO, as the case may be, to submit additional information to support the provided planning data.

The DWTSO may request each DWP, NSPO or WDSO, as the case may be, to carry out specific tests to verify that the planning data is in conformity with the applicable criteria and standards prepared by the DWTSO.

Each DWP, NSPO or WDSO, as the case may be, shall provide:

(a) the additional information requested under Section 0; and
(b) the results of the tests requested under Section 0,
within a period of thirty (30) Days from such request.

The costs of providing the additional information requested under Section 0 and of the tests requested under Section 0 shall be borne by such DWP, NSPO or WDSO (as the case may be).

The verification of any information, data or drawings by the DWTSO shall not constitute an endorsement of such information, data or drawings. The responsibility for the supplied information, data and drawings shall remain with the DWP, NSPO or WDSO (as the case may be).

DATA CONFIDENTIALITY

Without limiting Section GC.8 of the General Conditions, the DWTSO may publish any planning data provided by each User to the DWTSO, unless the relevant User requests the DWTSO to keep certain specified planning data confidential, and the DWTSO confirms ECRA’s agreement to this.
Main Actions:

**Timetable:**
- End of **June**
- End of **August**, each Year
- End of **September**, each Year
- End of **December**, each Year

1. **WDSO** submit demand forecasts
2. **Desalinated Water Producers** submit production forecasts
3. **NSPO** submit delivery forecasts
4. **DWTSO** prepares **Total Forecast**
5. **DWTSO** carries out **System Studies**
6. **DWTSO** prepares **Ten Year Statement**
7. **DWTSO** issues and submits **Ten Year Statement to ECRA**
CONNECTION CODE

CC.1 INTRODUCTION

CC.1.1 These Connection Code set out:

(a) the minimum technical, design and operational requirements that each User shall comply with where a Facility is connected to, or is to be connected to, the DWTS or the equipment of a PCC; and

(b) the procedural and formal requirements to be adhered to by each User seeking to have its Facility connected to the DWTS.

CC.2 OBJECTIVE

CC.2.1 The objective of the Connection Code is to:

(a) specify the minimum technical, design and operational criteria and requirements for any equipment connected to, or intended to be connected to, the DWTS or the equipment of a PCC; and

(b) assist each User in the connection process by specifying the connection procedure for connecting its Facility to the DWTS at any Connection Point.

CC.3 SCOPE

CC.3.1 The Connection Code apply to the DWTSO and the following Users:

(a) WDSOs;
(b) DWPs; and
(c) NSPOs.

and a reference to User shall include an Applicant User.

CC.4 CONNECTION POINT

CC.4.1 General

CC.4.1.1 A Connection Point is a point of connection established between:

(a) each Water Producer’s Facility and the DWTS;
(b) each DWP’s Facility and the equipment of a PCC; and
(c) each WDSO’s Facility and the DWTS.

CC.4.2 Interface Points

CC.4.2.1 The Interface Points are defined as follows:

(a) Interface Point I is the interface point between the Facility and the DWTS, prior to the date of issue of the Connection Certificate; and

(b) Interface Point II is the interface point between the Facility and the DWTS, on and after the date of issue of the Connection Certificate.

CC.4.2.2 A Connection Point comprises of two Interface Points as follows:

(a) Interface Point I; and
(b) Interface Point II.
CC.4.2.3 The locations of Interface Point I and II are as set out in CC-Appendix 3 and CC-Appendix 4.

CC.4.3 Connection Point Equipment
CC.4.3.1 The Connection Point Equipment shall be procured, installed, commissioned and tested by each User applying for connection, except for the shut-off valve which connects the Connection Point to the DWTS, which shall be procured, installed, commissioned and tested by the DWTSO.

CC.4.3.2 The standard Connection Point configurations are shown in CC-Appendix 3 and CC-Appendix 4.

CC.4.4 Equipment numbering system for the Connection Points
CC.4.4.1 Each User's Connection Point Equipment must be labeled by such User in accordance with the equipment numbering system guidelines stipulated by the DWTSO.

CC.4.4.2 The DWTSO shall be responsible for establishing the equipment numbering system guidelines, and notifying each User of such guidelines.

CC.4.5 Operational Diagram
CC.4.5.1 An Operational Diagram will at all times be maintained by each User, covering the Connection Point Equipment, and any part of the Facility adjacent to the Connection Point which may directly affect the ability of the DWTSO or each User to operate or maintain or otherwise have access to the Connection Point.

CC.4.5.2 The DWTSO shall provide to each User, information relating to the DWTS required by each User to prepare the Operational Diagram, prior to each User applying to connect its Facility to the DWTS.

CC.4.5.3 Each User shall then provide the Operational Diagram of its proposed new Connection Point to the DWTSO for review and approval by the DWTSO.

CC.4.6 Water Metering System
CC.4.6.1 The Water Metering System shall be designed and installed by each User in accordance with the requirements set out in CC-Appendix 5.

CC.4.6.2 Each User and the DWTSO shall take all reasonable steps to ensure that each Water Metering System is located as close as reasonably practicable to the Connection Point.

CC.4.6.3 Each Water Meter included within the Water Metering System at each Connection Point shall be independently operated by the DWTSO and each User, as the case may be.

CC.4.7 Online Monitoring System
CC.4.7.1 The Online Monitoring System shall be designed and installed by each User in accordance with the requirements set out in CC-Appendix 6.

CC.4.8 Shut-off Valve
CC.4.8.1 The shut-off valve connected to the DWTS and each Facility, as the case may be, shall be of a flanged type and must be in compliance with all relevant standards of:

(a) the Saudi Arabian Standards Organisation;

(b) ASME;
(c) the International Organization for Standardization; and
(d) any equivalent bodies whose standards are ordinarily applied in the Kingdom of Saudi Arabia.

CC.4.9 Data communication system

CC.4.9.1 The SCADA system of each User or the DWTSO, as the case may be, shall be connected at a point within the DWTS which is located adjacent to the relevant Connection Point.

CC.4.9.2 Each User shall be responsible for the procurement and installation of a data exchange cubicle at the Interface Point in accordance with Section CC.4.9.1. The location of the data exchange cubicle shall be set out in the relevant Connection Agreement.

CC.4.9.3 Each User shall be responsible for the design, procurement, installation, operation and maintenance of the data exchange cable connecting each User’s SCADA system and the data exchange cubicle.

CC.4.9.4 Each Water Meter included within the Water Metering System and the Online Monitoring System at each Connection Point, shall be connected to the SCADA system of the DWTSO or each User, as the case may be.

CC.4.9.5 The following information shall be exchanged periodically between each User and the DWTSO through the data communication system:
(a) the Water Meter Data;
(b) all data measured by the Online Monitoring System;
(c) the level of the next water storage tank either downstream or upstream of the relevant Connection Point, as well as the stored volume of Transmitted Water in such tank;
(d) the position of the inlet and outlet valves of the water storage tanks; and
(e) the level of alarm signals of the water storage tanks connected to the DWTS and each Facility.

CC.4.9.6 The communication protocol required for the exchange of information as described in CC.4.9.5 shall be specified by the DWTSO.

CC.4.10 Other equipment and accessories

CC.4.10.1 All other equipment and accessories used by each User at its Connection Point, as determined by the System Studies, shall be in compliance with the Saudi Arabian Standards Organisation’s standards, or such equivalent internationally recognized standards.

CC.5 CONNECTION PROCEDURE

CC.5.1 Each Applicant User and the DWTSO shall follow the connection procedure specified below and detailed in CC-Appendix 2.

CC.5.2 Application Form

CC.5.2.1 The Application Form shall be in a standard format prepared by the DWTSO and approved by ECRA.

CC.5.2.2 Each Applicant User shall obtain the Application Form from the DWTSO, and complete and submit the Application Form to the DWTSO.
Other than as expressly contemplated by this SWDC, each Applicant User shall not modify any Application Form previously submitted to the DWTSO.

The Application Form shall require each Applicant User to provide the Preliminary Water Planning Data as detailed in Section CC-App.1.1.

The Application Form shall require each Applicant User to comply with the SWDC to the extent necessary for the application procedure.

No later than thirty (30) Days after an Applicant User has submitted the Application Form to the DWTSO, the DWTSO shall review the submitted Application Form and notify that Applicant User whether it is satisfied that the submitted Application Form meets the requirements of the SWDC.

Subject to any extension of time under Section CC.5.5, the date of issue of such notification is the Application Acceptance Date.

Where the DWTSO has notified the Applicant User that it is not satisfied with the submitted Application Form in accordance with Section CC.5.2.6, the Applicant User may submit either a revised or new Application Form in accordance with Section CC.5.2.2.

Dispute

Any dispute between the DWTSO and the Applicant User that may arise under these Connection Code will be dealt with in accordance with the procedures set out in Section GC.10 of the General Conditions.

System Studies

After the DWTSO has reviewed a submitted Application Form in accordance with Section CC.5.2.6, the DWTSO shall carry out the System Study.

The cost of such System Studies shall be borne by the Applicant User that has submitted the relevant Application Form. However, prior to the commencement of such System Studies, the DWTSO shall notify the Applicant User of such estimated cost.

The System Studies shall utilise the electronic network model described in Section 0 of the Planning Code.

The System Studies shall determine:

(a) the impact of the proposed new connection on the DWTS;
(b) the necessary equipment required at the relevant Connection Point; and
(c) any further measures required to extend and/or modify other parts of the DWTS as a result of the proposed new connection on the DWTS.

Upon providing the results of the System Studies to the Applicant User, the DWTSO shall invoice the Applicant User for the preparation of the System Studies. The Applicant User shall pay the invoiced amount to the DWTSO prior to the Offer of Connection being provided to that Applicant User in accordance with Section CC.5.6.

Modifications to the Preliminary Water Planning Data in the Application Form (prior to the Offer of Connection) as may be required
If the DWTSO has accepted the Application Form of an Applicant User, but prior to the Offer of Connection being provided by the DWTSO to that Applicant User, that Applicant User then considers that modifications are required to the Preliminary Water Planning Data provided in the Application Form, that Applicant User shall immediately notify the DWTSO of such modifications.

The DWTSO shall decide whether the significance of such modifications requires its acceptance of the completed Application Form to be withdrawn, and shall notify that Applicant User of its decision within thirty (30) Days after having been notified of such modifications.

Where the DWTSO decides not to withdraw its acceptance of the completed Application Form, the following shall apply:

(a) the date that the DWTSO issues the notification in accordance with Section CC.5.2.7 shall be the Application Acceptance Date; and

(b) if the DWTSO shall decide that a System Study is required, then the DWTSO shall prepare such System Study in accordance with Sections CC.5.4.2 to CC.5.4.5.

Offer of Connection

Not later than ninety (90) Days after the Application Acceptance Date, the DWTSO shall:

(a) where the DWTSO is satisfied that the results of the System Study allow the DWTSO to prepare an Offer of Connection, prepare and submit to that Applicant User an Offer of Connection; or

(b) where as a result of that System Study, the DWTSO is not satisfied that the results of that System Study allow the DWTSO to prepare an Offer of Connection, notify that Applicant User of such refusal.

The Offer of Connection shall be prepared by the DWTSO, and submitted, subject to the payment in full by the Applicant User to the DWTSO of the invoiced amount pursuant to Section CC.5.4.5, to that Applicant User in a standard format prepared by the DWTSO and approved by ECRA.

The Offer of Connection shall specify the equipment required at the Connection Point, as well as the modifications required to the DWTS, if any, according to the results of the System Studies.

The Offer of Connection shall include a draft Connection Agreement based on the standard format in accordance with Section CC.5.8.1.

The Offer of Connection shall have a validity of 180 Days.

Modifications required to the Preliminary Water Planning Data in the Application Form (after the Offer of Connection) as may be required

If an Applicant User considers that modifications are required to the Preliminary Water Planning Data after having received an Offer of Connection (but prior to the execution of the Connection Agreement), that Applicant User shall immediately notify the DWTSO of such modifications.

The DWTSO shall decide whether the significance of such modifications requires the Offer of Connection to be withdrawn, and shall notify each Applicant User within a thirty (30) Day period of having been notified about
such modification. Where the DWTSO decides that the original Offer of Connection must be suspended, the following shall apply:

(a) the date that the DWTSO issues the suspension notification in accordance with Section CC.5.7.2 shall be the Application Acceptance Date;

(b) the DWTSO shall decide whether a System Study is required, and in such case, the DWTSO shall prepare such System Study in accordance with Sections CC.5.4.2 to CC.5.4.5;

(c) the DWTSO shall either issue a new Offer of Connection or notify that Applicant User of its refusal in accordance with Section CC.5.6.1; and

(d) if that Applicant User withdraws its notification in regards to the modifications to the Preliminary Water Planning Data, the suspended Offer of Connection shall be extended to the same validity date as any new Offer of Connection in accordance with Section CC.5.7.2.

CC.5.8 Connection Agreement
CC.5.8.1 The Connection Agreement shall be in a standard format prepared by the DWTSO and approved by ECRA.

CC.5.8.2 After the Offer of Connection has been accepted by that Applicant User, the draft Connection Agreement shall be finalised and agreed upon by that Applicant User and the DWTSO.

CC.5.8.3 The Connection Agreement shall be executed by the DWTSO and that Applicant User.

CC.5.8.4 The Connection Agreement shall include the Committed Water Planning Data.

CC.5.8.5 The Connection Agreement shall:

(a) require that Applicant User to comply with this SWDC, to the extent necessary; and

(b) set out the responsibilities of the DWTSO and that Applicant User in relation to the design, purchase, installation, testing, commissioning, operation and maintenance of the equipment to be installed at the Connection Point.

CC.5.9 Readiness to Connect Statement
CC.5.9.1 Each Applicant User shall prepare a Readiness to Connect Statement and submit this to the DWTSO after the completion of the Connection Activities in accordance with Section CC.6.2.

CC.5.9.2 The Readiness to Connect Statement shall be in a standard format prepared by the DWTSO and approved by ECRA.

CC.5.9.3 The Readiness to Connect Statement shall include the Connected Water Data and the relevant test reports prepared as part of the Connection Activities.

CC.5.10 Connection Certificate
CC.5.10.1 The DWTSO shall review and approve the Readiness to Connect Statement.
CC.5.10.2 The DWTSO shall prepare a Connection Certificate after approval of the Readiness to Connect Statement and issue it to that Applicant User.

CC.5.10.3 The Connection Certificate shall be in a standard format prepared by the DWTSO and approved by ECRA.

CC.5.10.4 Upon issuance of the Connection Certificate:
(a) that Applicant User will become a User; and
(b) the relevant Connection Point will become ready to commence operation.

CC.6 CONNECTION ACTIVITIES

CC.6.1 Each Applicant User connecting its Facility to the DWTS shall coordinate with the DWTSO to perform the Connection Activities in accordance with the following provisions under Section CC.6.2.

CC.6.2 The following Connection Activities must be carried out by each Applicant User:
(a) commissioning of each Applicant User’s Facility in conjunction with the commissioning of the DWTSO’s Connection Point Equipment;
(b) coordination of any required preparation of the DWTS at the Connection Point;
(c) installation of any additional equipment at the Connection Point required as a result of the System Studies;
(d) installation of the required Water Metering System and Online Monitoring System at the Connection Point in accordance with the Connection Agreement;
(e) initial calibration of the Water Metering System in accordance with CC-App.5.3.1;
(f) initial calibration of the Online Monitoring System in accordance with CC-App.6.3.1;
(g) inspection and commission testing of each User’s Connection Point equipment witnessed and approved by the DWTSO;
(h) preparation of a test report describing the tests carried out and summarizing the test results; and
(i) cleaning of the site at the Connection Point and removing all unused equipment, material and waste as well as removal of all of its own temporary installations.

CC.7 SAFETY RULES

CC.7.1 Each User working at each Connection Point shall comply with the safety rules to be established by the DWTSO.

CC.7.2 The design of each Connection Point shall focus on the safe operations of the Connection Point Equipment at all times, including System Emergencies, to avoid any risk to the health or safety of the operating staff.

CC.8 ENVIRONMENTAL ISSUES
CC.8.1 Each User in respect of its Connection Point Equipment and the DWTSO in respect of its equipment at the Connection Point shall comply with the environmental regulations and standards applicable to that Connection Point.

CC.8.2 The design of the Connection Points shall minimize any adverse environmental impact resulting from both normal operation and abnormal operating conditions.

CC.9 CONNECTION OF PCC

CC.9.1 Each DWP may supply Desalinated Water to a PCC.

CC.9.2 Each DWP may follow its own procedures for connecting its Facility to the equipment of a PCC.

CC.9.3 Each DWP is responsible for the Interface Point between its Facility and any PCC’s equipment being in compliance with the requirements set out in regards to a Connection Point in Section CC.4.

CC.9.4 A copy of any connection agreement between a DWP and a PCC where the Seawater Desalination Plant of such DWP is connected in addition to the DWTS, shall be provided by such DWP to the DWTSO.

CC.9.5 Upon request by the DWTSO, each DWP shall provide to the DWTSO any further information which the DWTSO requires to fulfil its obligations under the SWDC.
CC-APPENDIX 1 TYPES OF DATA

CC-App.1.1 Preliminary Water Planning

CC-App.1.1.1 The Preliminary Water Planning Data submitted to the DWTSO by each Applicant User as part of its Application Form, shall include:

(a) the name, address and contact details of that Applicant User;
(b) the name of the Seawater Desalination Plant or WDS, as the case may be, to which that data refers;
(c) the location of the proposed Connection Point, including map and coordinates;
(d) the capacity of the Connection Point as detailed in Sections 0 and 0 of the Planning Code, as the case may be; and
(e) the timeline to achieve operation of the Connection Point, including determined milestones by considering the connection procedure and physical implementation of the Connection Point.

CC-App.1.2 Committed Water Planning Data

CC-App.1.2.1 The Preliminary Water Planning Data shall be developed further into the Committed Water Planning Data by each Applicant User on the basis of the results of System Studies and the information provided by the DWTSO through the Offer of Connection.

CC-App.1.2.2 Such Committed Water Planning Data shall be included in the Connection Agreement and shall be the basis for the execution of the Connection Agreement.

CC-App.1.2.3 The Committed Water Planning Data shall comprise the following data:

(a) the name, address and contact details of that Applicant User at the Connection Point;
(b) the name of the Seawater Desalination Plant or WDS, as the case may be, to which that data refers;
(c) the location of the Connection Point, including map and coordinates;
(d) the licence to operate;
(e) the capacity of the Connection Point;
(f) the hydraulic calculation under all operating conditions, including the minimum and maximum pressure at the Connection Point;
(g) the minimum tank storage capacity for each Water Producer upstream of the Connection Point and for each WDSO downstream of the Connection Point;
(h) the layout plan of the installed equipment;
(i) the pipe drawings and pipe supports;
(j) the aeration and deaeration;
(k) the drainage and cleaning;
(l) the earthing and cathodic protection;
(m) the technical specifications of the Water Metering System and the Online Monitoring System;
(n) the hardware specifications for data communication; and
(o) the time schedule.

CC-App.1.3 Connected Water Data

CC-App.1.3.1 The Connected Water Data shall reflect the as-built status of the Connection Point.

CC-App.1.3.2 The Connected Water Data shall be prepared by each Applicant User by updating the Committed Water Planning Data with as-built information of the Connection Point, and shall additionally include:

(a) the test certificates of the installed Water Metering System;
(b) the test certificates of the installed Online Monitoring System;
(c) the test certificates for the communication interface; and
(d) the test certificates of all other installed equipment.

CC-App.1.3.3 Each Applicant User shall submit with the Readiness to Connect Statement the Connected Water Data.
CC-APPENDIX 2  FLOWCHART FOR CONNECTION PROCEDURE

1. Submission of Applicant Form by Applicant User to DWTSo
   - Evaluation of Applicant Form by DWTSo
     - Application acceptable?
       - NO
         - Notification to Applicant User by DWTSo
         - The Applicant User accepts?
           - YES
             - Revision of Application Form by Applicant User
           - NO
             - Dispute between Applicant User and DWTSo
               - Dispute resolved?
                 - YES
                   - System Studies conducted by DWTSo
                 - NO
                   - Dispute between Applicant User and DWTSo
               - Dispute resolved?
                 - YES
                   - System Studies conducted by DWTSo
                 - NO
                   - Dispute between Applicant User and DWTSo
     - YES
       - System Studies conducted by DWTSo
       - Results acceptable?
         - YES
           - Issue of Offer of Connection by DWTSo to Applicant User
           - Offer of Connection accepted by the Applicant User?
             - YES
               - Execution of Connection Agreement between Applicant User and DWTSo
             - NO
               - Execution of Connection Agreement by the Applicant User
         - NO
           - Rejection of Applicant User’s application by DWTSo
             - Dispute between Applicant User and DWTSo
               - The Applicant User accepts?
                 - YES
                   - Case closed
                 - NO
                   - Dispute between Applicant User and DWTSo
     - NO
       - Dispute between Applicant User and DWTSo
         - Dispute resolved?
           - YES
             - System Studies conducted by DWTSo
           - NO
             - Dispute between Applicant User and DWTSo

2. Submission of Readiness to Connect Statement by Applicant User
   - Issue of Connection Certificate by DWTSo
     - Start of operation of Connection Point
CC-APPENDIX 3  EQUIPMENT CONFIGURATION FOR THE CONNECTION
POINT BETWEEN EACH WATER PRODUCER’S FACILITY
AND THE DWTS

Seawater Desalination Plant
NSP

1  2  3  4  5  6  7

1 Shut off Valve
2 Back-up Water Meter
3 Online Monitoring System
4 Water Sample Point
5 Pressure Indicator
6 Main Water Meter
7 Shut off Valve

Interface Point II
Interface Point I

CC-APPENDIX 4  EQUIPMENT CONFIGURATION FOR THE CONNECTION
POINT BETWEEN EACH WDSO’S FACILITY AND THE
DWTS

DWTS

1  2  3  4  5  6  7

1 Shut off Valve
2 Back-up Water Meter
3 Online Monitoring System
4 Water Sample Point
5 Pressure Indicator
6 Main Water Meter
7 Shut off Valve

Interface Point I
Interface Point II
CC-APPENDIX 5 TECHNICAL REQUIREMENTS FOR THE WATER METERING SYSTEM

CC-App.5.1 General

CC-App.5.1.1 The Water Metering System shall be an electronic metering system in accordance with the relevant SASO, ISO, IEC, OIML or equivalent internationally recognized standards.

CC-App.5.1.2 The Water Metering System shall include the Water Meters with sensors and calculator units and required data transmission units.

CC-App.5.1.3 The Water Metering System shall either be a main Water Metering System or a backup Water Metering System installed in series at the Connection Point.

CC-App.5.1.4 The main Water Metering System and the backup Water Metering System shall not affect the operation of the other. The Water Meters of both Water Metering Systems shall feature the same levels of accuracy and functionality.

CC-App.5.1.5 The instrumentation systems of the Water Metering System shall be designed such that failure of the system shall not result in damage to the DWTS or Facility, as the case may be, or result in the development of a hazardous situation.

CC-App.5.1.6 The Water Metering System shall meter the volume flow and the quantity on a continuous basis and the information shall be displayed on a non-volatile register. The registers shall not pass through to zero more than once within the expected lifetime of the Water Meter, having regard to the total water volume flow in such period.

CC-App.5.1.7 In relation to the Water Meters used in accordance with the SWDC, certificates of conformity with the tariff meter standards shall be provided by each User to DWTSO.

CC-App.5.1.8 The Water Meters shall include a pulsed output providing instantaneous and integrated flow readings and shall be equipped with battery backup power supplies for 72 hour operation.

CC-App.5.2 Accuracy

CC-App.5.2.1 The Water Meter accuracy for the upper flow zone shall be equal or better than ±0.50% of the full-scale reading and shall have a temperature effect not greater than +0.5% per 50°C of the full-scale. The upper flow zone is characterized by as the range between the transitional flow rate and the overload flow rate in accordance with OIML R49.

CC-App.5.3 Installation

CC-App.5.3.1 Prior to installation, each Water Meter shall undergo initial calibration, to be done in a recognized test facility, including any meter manufacturer’s works. Such tests shall be performed in line with the OIML standards under consideration of the relevant IEC standards. A uniquely identifiable calibration record shall be provided by the recognized test facility before the meter enters service.

CC-App.5.3.2 The Applicant User will apply a certification seal following initial calibration.
The **Water Metering System** and associated communications equipment shall be located in a secure metering cabinet located in an area that is readily accessible, free from obstructions and well lit by artificial light. The cabinets shall include effective protection from moisture and dust ingress and from physical damage, including vibration. Appropriate temperature controls shall be provided. The cabinets must be lockable and capable of being sealed to prevent unauthorized access.

**CC-App.5.4 Durability**

CC-App.5.4.1 The **Water Metering System** must be resistant to corrosion for the lifetime of the works. Materials which are exposed to Desalinated Water must not corrode.

CC-App.5.4.2 In all cases materials shall be chosen that are compatible such that no chemical or electrochemical actions are present other than those intended. Support systems and housings for instrumentation devices mounted close to the water pipes shall be non-metallic.

**CC-App.5.5 Enclosures**

CC-App.5.5.1 The **Water Metering System** cabinet and any associated Water Metering Systems shall be rated IP 55 indoors and IP 65 outdoors as a minimum (IP code according IEC 60529). Where an instrumentation device is located below the flood level it shall be rated to IP 68 (submersible). Cable connections to Water Metering Systems shall not reduce the IP rating of the device.

CC-App.5.5.2 All Water Metering Systems shall function within the limits of their normal performance specification over the temperature range 0°C to 52°C at a relative humidity of between 10% and 90%.

CC-App.5.5.3 The **Water Metering System** shall be protected with shades against direct solar radiation.

**CC-App.5.6 Flow sensor requirements**

CC-App.5.6.1 Each flow **Water Metering System** shall comply with ISO 6817 and comprise a flow sensor mounted in the pipeline, a measurement transducer and a separate signal calculator.

CC-App.5.6.2 Where electromagnetic flow sensors meters are used, they shall be of the pulsed dc type with automatic zero error averaging and low power consumption.

CC-App.5.6.3 Flow sensors shall comprise of a Water Meter tube assembly containing all necessary electrodes, housing and terminations. The Water Meter tubes shall be made from a non-magnetic material lined with an inert substance suitable for the medium and flanged.

CC-App.5.6.4 The lining material shall extend from the bore of the tube to fully cover the raised face of the tube flanges. There shall be no protruding parts to restrict the flow.

CC-App.5.6.5 Where the Water Meter is designed to measure the reverse flow, the volume flown through the Water Meter during reverse flow conditions shall be recorded separately.

CC-App.5.6.6 The Water Meter tubes installed in areas susceptible to flooding shall be environmentally protected to IP 68 and shall be suitable for continual submergence at the likely depth of any flood water. Where potting
compounds are used to achieve this performance it shall not prevent disconnection of the sensor cabling.

**CC-App.5.6.7** The flow transducer shall provide the following facilities:

(a) adjustment of flow range according to the size of the flow sensor;
(b) independent 4 to 20 mA output proportional to flow rate and a 24 V dc pulse output suitable for an integration counter drive;
(c) manual adjustment of pulsed and current output response time; and
(d) failure of the flow sensor shall cause the output to be driven down scale.

**CC-App.5.6.8** The flow calculator shall provide the following characteristics:

(a) it shall receive output signals from the transducer(s) and from associated measuring instruments;
(b) it shall transform, calculate and store the results in memory;
(c) indicating device and correction devices shall be connected; and
(d) means of testing the calculator electronics shall be an integral part of the design.

**CC-App.5.7** **Data communications system**

**CC-App.5.7.1** All data communication equipment required for the purposes of this SWDC and forming part of or associated with any Water Meter or Water Metering System shall comply with:

(a) the relevant National and International Telecommunications Union standards and recommendations for data transmission via telecommunication systems; and
(b) other relevant equivalent and internationally recognized standards.

**CC-App.5.7.2** Any Water Meter communications system shall be independent of the operational SCADA data systems to avoid potential conflicts of interfacing and protocols.

**CC-App.5.7.3** Any Water Metering System owned by a User shall be connected to such User’s automatic meter reading equipment at its Facility.

**CC-App.5.7.4** The Water Metering Systems owned by the DWTSO shall be provided either with an integral or a separate Outstation. Any remote Outstation must be capable of being connected to and interrogated by an Instation at a central location of the DWTS. The Instation will download the Water Meter Data at the specified time and frequency.

**CC-App.5.7.5** The time stamp used for the reading of Water Meter Data and for the data exchange shall be generated by a centralized master clock operated by the DWTSO and synchronized with all Water Metering Systems of the DWTS.

**CC-App.5.7.6** Interrogation of the Outstations shall be possible using any of the following media, as specified by the DWTSO:

(a) public telephone networks;
(b) radio data networks;
(c) private networks;
(d) mains signalling/power line carrier channels/fibre optic channels;
(e) low power radios; and
(f) any other media specified by the DWTSO.

CC-App.5.7.7 Error checking facilities shall be included in all communication facilities between Outstations and Instations.

CC-App.5.8 Instations

CC-App.5.8.1 Instations shall be fitted with separate ports for local and remote interrogations. The local interrogation port would be capable of use for commissioning, maintenance and fault finding and time setting. A series of security levels and coding facilities shall be provided to limit access to data and other features to authorized Persons only.

CC-App.5.8.2 Instations shall be capable of collecting all Water Meter Data by daily interrogation or other time interval to be specified. It should however, be possible to repeat collections of Water Meter Data at any time throughout the Outstation data storage period.

CC-App.5.8.3 One pair of Instations shall be located at the Load Dispatch Centre (LDC) to communicate directly with all Outstations. Such Instations at the LDC shall interface with the DWTSO computers to enable required calculations to be carried out and data to be presented within DWTSO.

CC-App.5.9 Data transmission units and Outstations

CC-App.5.9.1 Outstations shall be fitted with separate ports for local and remote interrogations. The local interrogation port would be capable of use for commissioning, maintenance and fault finding and time setting. A series of security levels and coding facilities shall be provided to limit access to data and other features to authorized Persons only.

CC-App.5.9.2 Each Water Meter shall provide two outputs per measured quantity and shall enable Water Meter Data to be interrogated locally and remotely over communications channels.

CC-App.5.9.3 The data transmission units and Outstations shall provide two outputs; one dedicated to the DWTSO and the other one dedicated to the relevant User.

CC-App.5.9.4 The Water Meter and Outstations shall provide, by means of the local interrogation port, facilities for configuring the instrumentation system. It shall provide a local LCD display of the measured parameter, programming facilities and fault annunciation.

CC-App.5.9.5 Outstations may perform some processing of data. The Outstation data shall conform to the format and protocol specified by the DWTSO.

CC-App.5.9.6 Each Outstation shall be connected to an uninterruptable power supply system with separate fusing to enable a secure power supply to the Outstation.

CC-App.5.9.7 The Outstations shall provide an alarm output signal at a permanently manned control room in the event of a supply failure.

CC-App.5.9.8 The Water Meter Data together with alarm indications, and Outstation time and date shall be capable of being transferred on request during the Water Meter Data interrogation process.

CC-App.5.10 Data display and storage
CC-App.5.10.1 The Water Metering Systems shall measure the quantities on a continuous way and the data shall be displayed on a non-volatile Water Meter register. The language of displays shall be English.

CC-App.5.10.2 Where Water Meters provide Water Meter Data to Outstations external to the Water Meter, the Outstations shall provide two outputs per measured quantity.

CC-App.5.10.3 Where a separate Outstation is used, cumulative register values shall be provided in the Outstation that can be set to match and increment with the Water Meter registers.

CC-App.5.10.4 Any Outstations shall have the capability to store all Water Meter Data collected by the respective Water Meters including alarms and other functions for relevant parties for two (2) complete calendar months.
CC-APPENDIX 6  TECHNICAL REQUIREMENTS FOR THE ONLINE MONITORING SYSTEM AND SAMPLE POINT

CC-App.6.1  General

CC-App.6.1.1 The Online Monitoring System and the Sample Point shall be designed in accordance with any, or a combination of, the SASO, ISO, NEMA or IEEE standards or equivalent internationally recognized standards.

CC-App.6.1.2 The Sample Point shall be in compliance with the requirements for water quality sampling in accordance with the SASO standards or equivalent internationally recognized.

CC-App.6.1.3 The Online Monitoring System at the Connection Point between each Seawater Desalination Plant or the NSP, as the case may be, and the DWTS or the PCC, as the case may be, shall contain equipment capable of:

(a) measuring continuously:
   (i) the temperature;
   (ii) the pH value;
   (iii) the conductivity;
   (iv) the turbidity;
   (v) the residual chlorine;
(b) measuring quasi-continuously alkalinity; and
(c) calculating from the above measured parameters the:
   (i) total dissolved solids; and
   (ii) Langelier Saturation Index.

CC-App.6.1.4 The Online Monitoring System at the Connection Point between the DWTS and the WDS shall contain equipment capable of measuring:

   (i) the temperature;
   (ii) the pH value;
   (iii) the conductivity;
   (iv) the alkalinity (quasi-continuously); and
   (v) the residual chlorine.

CC-App.6.1.5 The Online Monitoring System shall contain an Outstation. The Outstations may integrate the converter and calculator units.

CC-App.6.1.6 The Online Monitoring Systems shall include equipment in series with a means of removing such equipment without affecting the operation of the other equipment.

CC-App.6.1.7 The Outstations shall provide two outputs per measured parameter and shall enable the parameter to be interrogated locally and at a later date for parameter to be provided remotely over the communications channels.

CC-App.6.1.8 The converter units/Outstations shall provide, by means of the local interrogation port, facilities for configuring the instrumentation system. It
shall provide a local LCD display of the measured parameter, programming facilities and fault annunciation.

CC-App.6.1.9 Instrumentation systems shall be designed such that failure of the system shall not result in damage to plant or result in the development of a hazardous situation.

CC-App.6.1.10 Further requirements of the **Online Monitoring System, Sample Point** or parameters shall be determined and/or updated from time to time by the **DWTSO**.

**CC-App.6.2 Accuracy**

CC-App.6.2.1 The accuracy of all equipment of the **Online Monitoring System** over the normal operating range shall be equal or better than ±0.50% of full-scale reading.

**CC-App.6.3 Installation**

CC-App.6.3.1 Each item of equipment of the **Online Monitoring System** shall be initially calibrated according to the manufacturer’s requirements prior to its installation.

CC-App.6.3.2 The **Online Monitoring System** and associated communications equipment shall be located in a secure metering cabinet located in an area that is readily accessible, free from obstructions and well lit by artificial light.

CC-App.6.3.3 The cabinets shall include effective protection from moisture and dust ingress and from physical damage, including vibration. Appropriate temperature controls shall be provided. The cabinets must be lockable and capable of being sealed to prevent unauthorized access.

**CC-App.6.4 Durability**

CC-App.6.4.1 The **Online Monitoring System** shall be resistant to corrosion for the lifetime of the works. Materials which are exposed to the **Desalinated Water** must be chosen so as not to corrode.

CC-App.6.4.2 In all cases materials shall be chosen that are compatible such that no chemical or electrochemical actions are present other than those intended. Support systems and housings for instrumentation devices mounted close to water pipes shall be non-metallic.

**CC-App.6.5 Enclosures**

CC-App.6.5.1 The **Online Monitoring System** and its associated cabinet shall be rated IP 55 indoors and IP 65 outdoors as a minimum. Where an instrumentation device is located below the flood level it shall be rated to IP 68 (submersible). Cable connections to **Online Monitoring System** shall not reduce the IP rating of the device.

CC-App.6.5.2 All **Online Monitoring Systems** shall function within the limits of their normal performance specification over the temperature range 20°C to 52°C at a relative humidity of between 10% and 90%.

CC-App.6.5.3 The **Online Monitoring System** shall be protected with shades against direct solar radiation.

**CC-App.6.6 Data communications system**

CC-App.6.6.1 All data communication equipment required for the purposes of the **SWDC** shall comply with:
(a) the relevant National and International Telecommunications Union standards and recommendations for data transmission via telecommunication systems; and

(b) other relevant equivalent and internationally recognized standards.

CC-App.6.6.2 All Online Monitoring System communications systems shall be independent of the operational SCADA data systems to avoid potential conflicts of interfacing and protocols.

CC-App.6.6.3 Any Online Monitoring System owned by the User or the DWTSO, as the case may be, shall be provided either with an integral or a separate Outstation. Any remote Outstation must be capable of being connected to and interrogated by an Instation at a central location of the DWTS. The Instation will download the Online Monitoring System at the specified time and frequency.

CC-App.6.6.4 A centralized master clock operated by the DWTSO shall generate the time stamp used for the reading of Online Monitoring System and for the data exchange.

CC-App.6.6.5 Interrogation of the Outstations shall be possible using any of the following media, as specified by the DWTSO:

(a) public telephone networks;
(b) radio data networks;
(c) private networks;
(d) mains signalling/power line carrier channels/fibre optic channels;
(e) low power radios; and
(f) any other media specified by the DWTSO.

CC-App.6.6.6 Error checking facilities shall be included in all communication facilities between Outstations and Instations.

CC-App.6.7 Installations

CC-App.6.7.1 Installations shall be fitted with separate ports for local and remote interrogations. The local interrogation port would be capable of use for commissioning, maintenance and fault finding and time setting. A series of security levels and coding facilities shall be provided to limit access to data and other features to authorized Persons only.

CC-App.6.7.2 Installations shall be capable of collecting all data from the Online Monitoring System by daily interrogation or other time interval to be specified. It should however, be possible to repeat collections of data at any time throughout the Outstation data storage period.

CC-App.6.8 Data transmission units and Outstations

CC-App.6.8.1 Outstations shall be fitted with separate ports for local and remote interrogations. The local interrogation port shall be capable of use for commissioning, maintenance and fault finding and time setting. A series of security levels and coding facilities shall be provided to limit access to data and other features to authorized Persons only.

CC-App.6.8.2 Each analyzer shall provide two outputs per measured parameter. The design of the Online Monitoring System shall ensure that measured and
calculated data can be interrogated locally and remotely over communications channels.

CC-App.6.8.3 The data transmission units and **Outstations** shall provide two outputs; one dedicated to the **DWTSO** and the other one dedicated to the relevant User.

CC-App.6.8.4 The analyzer and **Outstations** shall provide, by means of the local interrogation port, facilities for configuring the instrumentation system. It shall provide a local LCD display of the measured parameter, programming facilities and fault annunciation.

CC-App.6.8.5 **Outstations** may perform some processing of data. The **Outstation** data shall conform to the format and protocol specified by the **DWTSO**.

CC-App.6.8.6 Each **Outstation** shall be connected to an uninterruptable power supply system with separate fusing to enable a secure power supply to the **Outstation**.

CC-App.6.8.7 The **Outstations** shall provide an alarm output signal at a permanently manned control room in the event of a supply failure.

CC-App.6.9 **Data display and storage**

CC-App.6.9.1 The **Online Monitoring System** shall measure the qualities on a continuous way and the data shall be displayed. The language of displays shall be English.

CC-App.6.9.2 Any **Outstations** shall have the capability to store all data of the analyzer collected by the respective **Online Monitoring System** including alarms and other functions for relevant parties for two (2) complete calendar months.
OPERATION CODE 1: OPERATIONAL PLANNING

OC1.1 INTRODUCTION

OC1.1.1 This Operation Code 1 - Operational Planning addresses the preparation by the DWTSO of the One (1) Year Operating Plan (OYOP) and the Three (3) Year Operating Plan (TYOP).

OC1.1.2 In order for the DWTSO to prepare the OYOP and the TYOP, each User shall provide the forecast data and maintenance scheduling information as follows:

(a) each WDSO shall provide to the DWTSO its Transmitted Water demand forecast data;
(b) each Water Producer shall provide to the DWTSO its Desalinated Water or Water, as the case may, production forecast data; and
(c) each Water Producer and each WDSO shall provide to the DWTSO its maintenance schedule in relation to its Facility.

OC1.2 OBJECTIVE

OC1.2.1 The objectives of this Operation Code 1 - Operational Planning is to provide for the:

(a) preparation by the DWTSO of the OYOP and the TYOP;
(b) distribution by the DWTSO of the OYOP and the TYOP to each User; and
(c) notification by the DWTSO to ECRA and MOWE of any issues of concern raised in the OYOP or the TYOP.

OC1.3 SCOPE

OC1.3.1 This Operation Code 1 - Operational Planning applies to the DWTSO and to the following Users:

(a) Water Producers; and
(b) WDSOs.

OC1.4 ONE (1) YEAR OPERATING PLAN

OC1.4.1 The OYOP shall be prepared annually by the DWTSO.

OC1.4.2 WDSO demand forecast data

OC1.4.2.1 By the end of March each Year, each WDSO shall provide to the DWTSO, in relation to each of its Connection Points, its best estimate of the information listed below, for each Day of the following Year:
(a) the daily average volume flow of Transmitted Water to be withdrawn by that WDSO from the DWTS, taking into consideration any unplanned outage risks; and

(b) the daily peak hourly volume flow of Transmitted Water to be withdrawn by that WDSO from the DWTS.

OC1.4.2.2 In preparing the WDSO demand forecast data, each WDSO shall take into account the following information:

(a) any relevant historical trends;

(b) the relevant demand patterns over daily and weekly periods;

(c) the projected demand growth; and

(d) the then current TYOP.

OC1.4.2.3 Together with the demand forecast data as described in Section OC1.4.2.1, each WDSO shall provide at the same time to the DWTSO, in relation to each of its Connection Points, its best estimate of the information listed below, for each Planned Outage scheduled to take place in the following Year:

(a) the scheduled start dates and ends dates of all Planned Outages;

(b) any reduction or increase to the daily average volume flow of Transmitted Water to be withdrawn by that WDSO; and

(c) any reduction or increase to the daily peak hourly volume flow of Transmitted Water to be withdrawn by that WDSO.

OC1.4.2.4 By the end of March each Year, each WDSO shall provide to the DWTSO details, including any relevant explanation, of any deviation in the WDSO demand forecast data (provided in the previous Year under Section OC1.4.2.1) from the actual demand of Transmitted Water withdrawn by that WDSO in the Year.

OC1.4.3 Water Producer forecast data

OC1.4.3.1 By the end of March each Year, each Water Producer shall provide to the DWTSO, in relation to each of its Connection Points, its best estimate of the information listed below, for each Day of the following Year:

(a) the daily average volume flow of Desalinated Water or Water, as the case may be, to be produced by that Water Producer and delivered to the DWTS, taking into consideration any unplanned outage risks; and

(b) the daily peak hourly volume flow of Desalinated Water or Water, as the case may be, to be produced by that Water Producer and delivered to the DWTS.

OC1.4.3.2 In preparing the Water Producer production forecast data, each Water Producer shall take into its account the following:

(a) any relevant historical trends;

(b) the relevant production patterns over daily and weekly periods;

(c) the projected demand growth; and
(d) the then current TYOP.

OC1.4.3.3 Together with the production forecast data as described in Section OC1.4.3.1, each Water Producer shall provide at the same time to the DWTSO, in relation to each of its Seawater Desalination Plants or NSPs, as the case may be, its best estimate of the information listed below, for each Planned Outage scheduled to take place in the following Year:

(a) the scheduled start dates and end dates of all Planned Outages;
(b) any reduction to the daily average volume flow of Desalinated Water or Water, as the case may be, to be produced by that Water Producer and delivered into the DWTS; and
(c) any reduction to the daily peak hourly volume flow of Desalinated Water or Water, as the case may be, to be produced by that Water Producer and delivered to the DWTS.

OC1.4.3.4 Each DWP shall clearly state which amounts of Desalinated Water will be delivered into the DWTS, net of any amount which shall be delivered to any PCC connected to its Facility.

OC1.4.3.5 By the end of March each Year, each Water Producer shall provide to the DWTSO details, including any relevant explanation, of any deviation in the Water Producer production forecasts data (provided in the previous Year under Section OC1.4.3.1) from the actual Desalinated Water or Water, as the case may be, as produced by each Water Producer in the Year.

OC1.4.4 Maintenance schedules for the DWTS

OC1.4.4.1 By the end of March each Year, the DWTSO shall prepare, in relation to each of its Connection Points, its best estimate of the maintenance schedule for each Planned Outage of the DWTS or parts thereof scheduled to take place in the following Year.

OC1.4.5 Preparation of the OYOP

OC1.4.5.1 The DWTSO shall use the demand and production data forecasts including each Planned Outage schedule information (provided under Sections OC1.4.2 and OC1.4.3) and the maintenance schedule information (provided under Section OC1.4.4) to produce the OYOP.

OC1.4.5.2 The DWTSO shall work with each Water Producer and each WDSO to seek to minimise any disruption to:

(a) the production and delivery of the Desalinated Water or the Water, as the case may be, to the DWTS; and
(b) the withdrawal of the Transmitted Water by the WDSOs, in the event of any scheduled maintenance (provided for under Section OC1.4.4) and any Planned Outage (provided for under Sections OC1.4.4).

OC1.4.5.3 In preparing the OYOP, the DWTSO shall consider:

(a) the condition of the network hydraulics of the DWTS; and
(b) any other network losses in relation to the DWTS.
OC1.4.6 Distribution of the OYOP

OC1.4.6.1 By the end of September each Year, the DWTSO shall:
(a) distribute the OYOP to each User and to ECRA and MOWE; and
(b) highlight and explain to ECRA and MOWE any issues of concern raised in the OYOP which, in the reasonable opinion of the DWTSO, should be managed by ECRA or MOWE, as the case may be.

OC1.5 THREE (3) YEAR OPERATING PLAN

OC1.5.1 The TYOP shall be prepared annually by the DWTSO.

OC1.5.2 WDSO demand forecast data

OC1.5.2.1 By the end of June each Year, each WDSO shall provide to the DWTSO, in relation to each of its Connection Points, its best estimate of the information listed below, for each calendar week of the term of the TYOP:
(a) the weekly average volume flow of Transmitted Water to be withdrawn by that WDSO from the DWTS, taking into consideration any unplanned outage risks; and
(b) the weekly peak hourly volume flow of Transmitted Water to be withdrawn by that WDSO from the DWTS.

OC1.5.2.2 In preparing the WDSO demand forecast data, each WDSO shall take into its account the following:
(a) any relevant historical trends;
(b) the relevant demand patterns over weekly and yearly periods; and
(c) the projected demand growth.

OC1.5.2.3 Together with its demand forecasts data as described in Section OC1.5.2.1, each WDSO shall provide at the same time to the DWTSO, in relation to each of its Connection Points, its best estimate of the information listed below, for each Planned Outage scheduled to take place during the term of the TYOP:
(a) the type or purpose of the Planned Outage;
(b) the duration of the Planned Outage;
(c) the earliest date to start the Planned Outage;
(d) the preferred date to start the Planned Outage;
(e) the latest date to end the Planned Outage;
(f) any reduction or increase to the daily average volume flow of Transmitted Water to be withdrawn by that WDSO; and
(g) any reduction or increase to the daily peak hourly volume flow of Transmitted Water to be withdrawn by that WDSO.
By the end of June each Year, each WDSO shall provide to the DWTSO details, including any relevant explanation, of any deviation in the WDSO demand forecasts data (provided in the previous Year under Section OC1.5.2.I) from the actual demand of Transmitted Water withdrawn by that WDSO in the relevant Years.

Water Producer forecast data

By the end of June each Year, each Water Producer shall provide to the DWTSO, in relation to each of its Connection Points, its best estimate of the information listed below, for each calendar week of the term of the TYOP:

(a) the weekly average volume flow of Desalinated Water or Water, as the case may be, to be produced by that Water Producer and delivered to the DWTS, taking into consideration any unplanned outage risks; and

(b) the weekly peak hourly volume flow of Desalinated Water or Water, as the case may be, to be produced by that Water Producer and delivered to the DWTS.

In preparing the Water Producer production forecasts data, each Water Producer shall take into its account the following:

(a) any relevant historical trends;

(b) the relevant production patterns over daily and weekly periods; and

(c) the projected demand growth.

Together with its production forecasts data as described in Section OC1.5.3.1, each Water Producer shall provide at the same time to the DWTSO, in relation to each of its Seawater Desalination Plant or NSPs, as the case may be, its best estimate of the information listed below, for each Planned Outage scheduled to take place during the term of the TYOP:

(a) the type or purpose of the Planned Outage;

(b) the duration of the Planned Outage;

(c) the earliest date to start the Planned Outage;

(d) the preferred date to start the Planned Outage;

(e) the latest date to end the Planned Outage;

(f) any reduction to the daily average volume flow of Desalinated Water or Water, as the case may be, to be produced by that Water Producer and delivered into the DWTS; and

(g) any reduction to the daily peak hourly volume flow of Desalinated Water or Water, as the case may be, to be produced by that Water Producer and delivered to the DWTS.

Each Water Producer shall clearly state which amounts of Desalinated Water or Water, as the case may be, will be delivered into the DWTS, net of any amount which shall be delivered to the PCCs, if any.
By the end of June each Year, each Water Producer shall provide to the DWTSo details, including any relevant explanation, of any deviation in the Water Producer production forecasts data (provided in the previous Year under Section OC1.5.3.1) from the actual Desalinated Water or Water, as the case may be, produced by each Water Producer in the relevant Years.

OC1.5.4 Maintenance schedule for the DWTS

By the end of June each Year, the DWTSo shall prepare, in relation to each of its Connection Points, its best estimate of the maintenance schedule for each Planned Outage of the DWTS or parts thereof, scheduled to take place during the term of the TYOP.

OC1.5.5 Preparation of the TYOP

The DWTSo shall use the demand and production data forecasts including the Planned Outage schedules (provided in Sections OC1.5.2 and OC1.5.3) and the maintenance schedule information (provided in Section OC1.5.4) to produce the TYOP.

OC1.5.5.1 The DWTSo shall work with each Water Producer and each WDSO to seek to minimise any disruption to:

(a) the production and delivery of the Desalinated Water or the Water, as the case may be, to the DWTS; and

(b) the withdrawal of the Transmitted Water by the WDSOs, in the event of any Planned Outage (provided for under Sections OC1.5.2.3 and OC1.5.3.3) and any scheduled maintenance (provided for under Section OC1.5.4).

OC1.5.5.2 In preparing the TYOP, the DWTSo shall consider:

(a) the condition of the network hydraulics of the DWTS; and

(b) any other network losses in relation to the DWTS.

OC1.5.5.3 The initial preparation

In producing the TYOP, the DWTSo shall initially assume that all Planned Outages will start on the preferred dates (as provided in Sections OC1.5.4.1 and Error! Reference source not found.), and shall identify whether the Reserve Desalination Capacity can be met at all times.

OC1.5.5.4 The final preparation

If the DWTSo determines that the initial approach yields no Operational Plan that can achieve Reserve Desalination Capacity at all times, the DWTSo:

(a) shall shift the outage periods of each Seawater Desalination Plant and the WDS within the timeframe set by the corresponding earliest dates and latest dates;

(b) shall coordinate with each DWP and each WDSO on any possible shifting of maintenance periods to maximize Transmitted Water supply to each WDSO;
(c) shall identify the operational plan which provides the highest security of supply considering each **Connection Point** to the **WDS**; and

(d) shall determine the operating plan version with the highest security of supply to be the **TYOP**.

**OC1.5.5.2** If the **DWTSO** determines that the final preparation yields no **TYOP** that achieves **Reserve Desalination Capacity** at all times, the **DWTSO** shall highlight and explain this issue to **ECRA** and **MOWE** in accordance with **Section OC1.5.6.1(b)**.

**OC1.5.5.3** Any disputes that may arise as a result of the above process shall be resolved in accordance with the procedures set out in **Section GC.10** of the **General Conditions**.

**OC1.5.6** Distribution of the **TYOP**

**OC1.5.6.1** By the end of September each **Year**, the **DWTSO** shall:

(a) distribute the **TYOP** to each **User** and to **ECRA** and **MOWE**; and

(b) highlight and explain to **ECRA** and **MOWE** any issues of concern raised in the **TYOP**, which, in the reasonable opinion of the **DWTSO**, should be managed by **ECRA** or **MOWE**, as the case may be.
OPERATION CODE 2: SAFETY CO-ORDINATION PROCEDURE

OC2.1 INTRODUCTION

OC2.1.1 This Operation Code 2 - Safety Co-ordination Procedure sets out:

(a) the operational and safety co-ordination procedures to be followed by the DWTSO and each User in relation to works (as set out in Section OC2.4.1.2) to be performed on a Connection Point;

(b) the appointment of the Safety Co-ordinators of the DWTSO and the Users; and

(c) the documentation to be retained by the DWTSO and the Users in relation to the Operational and Safety Co-ordination Procedures.

OC2.2 OBJECTIVE

OC2.2.1 The objective of this Operation Code 2 - Safety Co-ordination Procedure is to seek to ensure that works can be undertaken at the Connection Point between the DWTSO and each User in a safe and co-ordinated manner.

OC2.3 SCOPE

OC2.3.1 This Operation Code 2 - Safety Co-ordination Procedure applies to the DWTSO and to the following Users:

(a) DWPs;
(b) WDSOs; and
(c) NSPOs.

OC2.4 SAFETY CO-ORDINATION PROCEDURE

OC2.4.1 The Operational and Safety Co-ordination Procedures

OC2.4.1.1 The DWTSO and each User in respect of each Connection Point shall mutually exchange copies of their most up-to-date Operational and Safety Co-ordination Procedures at each Connection Point.

OC2.4.1.2 Operational and Safety Co-ordination Procedures are those operations and safety co-ordination procedures that relate to the following:

(a) the start of any operations at the Facility or the DWTS;
(b) the shutdown of any operations at the Facility or the DWTS;
(c) the isolation of the Facilities from the DWTS;
(d) the physical work that may be undertaken at the Connection Point; and
(e) the re-connection or re-engagement of the Facility to the DWTS.
OC2.4.1.3 If an **Operational and Safety Co-ordination Procedure** is amended by the DWTSO or a User, as the case may be, after it has been provided to the DWTSO or a User, as the case may be, that party amending the **Operational and Safety Co-ordination Procedure** must notify the other party of such amendment, prior to the implementation of the amendment.

**OC2.4.2 Safety Co-ordinator**

**OC2.4.2.1** The DWTSO and each User shall, at all times, have a nominated Safety Co-ordinator, who shall be responsible for the identification and implementation of the **Operational and Safety Co-ordination Procedures** of the relevant party.

**OC2.4.2.2** Each User shall notify the DWTSO of the identity and contact details of its Safety Co-ordinator immediately prior to the establishment of any Connection Point.

**OC2.4.2.3** The DWTSO shall notify each User of the identity and contact details of its Safety Co-ordinator immediately prior to the establishment of any Connection Point.

**OC2.4.2.4** If either the DWTSO or the User changes its Safety Co-ordinator, the party changing its Safety Co-ordinator must notify the other party of such change.

**OC2.4.3 Work**

**OC2.4.3.1** If work is to be carried out at the Connection Point by either the DWTSO or a User, as the case may be, which requires the **Operational and Safety Co-ordination Procedures** to be complied with, the Safety Co-ordinator of the party to perform the work shall contact the Safety Co-ordinator of the party responsible for the connected Facility or the DWTS, as the case may be, and both Safety Co-ordinators shall agree on the **Operational and Safety Co-ordination Procedures** to be implemented for such works.

**OC2.4.3.2** If the Safety Coordinators are not able to agree on the **Operational and Safety Co-ordination Procedures** to be implemented in accordance with Section OC2.4.3.1, either Safety Co-ordinator may report the disagreement to ECRA. ECRA will then, at its discretion, decide on the matter.

**OC2.4.3.3** The implementation of the agreed **Operational and Safety Co-ordination Procedures** shall be confirmed in writing by both Safety Co-ordinators before work at the Connection Point can begin.

**OC2.4.3.4** Where the **Operational and Safety Co-ordination Procedure** agreed to be implemented under Section OC2.4.3.3 is required by either Safety Co-ordinator to be changed, the Safety Co-ordinator who has requested the change shall immediately notify the other Safety Co-ordinator, of such change, and agreement must be reached on the change prior to the work beginning. If the relevant parties are not able to agree on the change to the **Operational and Safety Co-ordination Procedures**, either party may report the disagreement to ECRA. ECRA will then, at its discretion, decide on the disagreement.
OC2.4.4 Documentation

OC2.4.4.1 Both, the DWTSO and each User whose Facility is connected to the DWTS at the relevant Connection Point shall retain the following documentation for a period of not less than one (1) year:

(a) the records of any request for Operational and Safety Co-ordination Procedures;

(b) the records of any implementation of any Operational and Safety Co-ordination Procedures; and

(c) the chronological record of all communications relating to Operational and Safety Co-ordination Procedures sent or received in accordance with this SWDC.
OPERATION CODE 3: INCIDENT AND INCIDENT REPORTING

OC3.1 INTRODUCTION

OC3.1.1 This Operation Code 3 - Incident and Incident Reporting is designed to ensure that where an Incident occurs at a Facility or on the DWTS, the User or the DWTSO, as the case may be, shall provide the other with timely and accurate data and other information in relation to the Incident.

OC3.1.2 The data and other information provided by the User to the DWTSO in relation to an Incident, and the data and information provided to the affected Users by the DWTSO, shall allow the DWTSO to:

(a) assess the Incident;
(b) notify the affected Users of the Incident;
(c) perform, coordinate and supervise the remedial measures to be carried out to remedy the Incident;
(d) identify any need to amend the SWDC; and
(e) classify the event as either an Incident or Significant Incident.

OC3.1.3 The rules and regulations outlined in this Operation Code 3 - Incident Reporting are separate and independent to any other requirements of ECRA in relation to the reporting of events.

OC3.2 OBJECTIVE

OC3.2.1 The objective of this Operation Code 3 - Incident and Incident Reporting is to provide for the timely and precise notification and exchange of data and information in relation to an Incident, between each User and the DWTSO, to enable:

(a) each User to manage its Facilities in the event of an Incident; and
(b) the DWTSO to manage the DWTS in the event of an Incident.

OC3.3 SCOPE

OC3.3.1 This Operation Code 3 - Incident and Incident Reporting applies to the DWTSO and to the following Users:

(a) DWP;
(b) NSPO; and
(c) WDSO.
OC3.4 INCIDENTS

OC3.4.1 Incident means any unscheduled or unplanned event in relation to the Facility or the DWTS, as the case may be, which results in that unscheduled or unplanned event causing an operational effect in relation to the DWTS or the Facility, as the case may be, and comprises an Adverse Environmental Incident, a Health and Safety Incident or an Operation Incident in relation to the DWTS or the Facility, as the case may be. An Incident may subject to Section OC5.1.1, be classified as a Significant Incident.

OC3.4.2 An Incident, without limiting Section OC3.4.1, may be caused by the following examples:

(a) the improper operation of the Facility by the User;
(b) the improper operation of the DWTS by the DWTSO;
(c) an unplanned act of the User in relation to the Facility, including an Unplanned Outage;
(d) an unplanned act of the DWTSO in relation to the DWTS, including an Unplanned Outage;
(e) a breakdown or malfunctioning of equipment in relation to the Facility or the DWTS, as the case may be;
(f) adverse weather conditions or an act of nature affecting the Facility or the DWTS, as the case may be;
(g) an accident in relation to the Facility or the DWTS, as the case may be;
(h) a workers strike or other industrial action affecting a User or the DWTSO, as the case may be; or
(i) an act of sabotage in relation to the Facility or the DWTS, as the case may be.

OC3.4.3 An Incident does not include a Water Quality Failure, which is dealt with in Section OC4.8

OC3.4.4 Initial notification of an Incident by the User to the DWTSO

OC3.4.4.1 If a User becomes aware of an Incident on its Facility, regardless of whether the Incident is caused by that User, that User shall immediately notify the DWTSO of the Incident, so that the DWTSO can:

(a) implement remedial measures to protect the DWTS and the Facilities;
(b) supervise any remedial measures relating to other Users or the DWTS, as the case may be, put in place to mitigate the resulting effects of the Incident; and
(c) amend the terms of the Dispatch Instructions.
OC3.4.4.2 A notification provided under Section OC3.4.4.1 shall contain the following information:

(a) the name of the User notifying the DWTSO of the Incident, including, the name and contact details of the individual (representing the User) making the notification;

(b) the time and location of the Incident;

(c) the nature of the Incident. The User need not state the cause of the Incident, but must describe the Incident in sufficient detail to enable the DWTSO to reasonably consider and assess the implications and risks arising from the Incident;

(d) the expected or observed extent of any effects of the Incident;

(e) the assumed effects on the Facility and the DWTS, as the case may be, of the Incident;

(f) the remedial measures that have been carried out, or are planned to be carried out, by the User in relation to the Incident; and

(g) the other Users that could be affected by the Incident.

OC3.4.5 Initial notification of an Incident by the DWTSO to the affected Users

OC3.4.5.1 If the DWTSO becomes aware of an Incident on the DWTS, regardless of whether the Incident is caused by the DWTSO, the DWTSO shall immediately notify the affected Users of the Incident.

OC3.4.5.2 A notification provided under Section OC3.4.5.1 shall contain the following information:

(a) the time and location of the Incident;

(b) the nature of the Incident. The DWTSO need not state the cause of the Incident, but must describe the Incident in sufficient detail to enable the affected Users to reasonably consider and assess the implications and risks arising from the Incident;

(c) the expected or observed extent of any effects of the Incident;

(d) the assumed effects on the Facility and the DWTS, as the case may be, of the Incident;

(e) the remedial measures that have been carried out, or are planned to be carried out, in relation to the Incident; and

(f) the other Users that could be affected by the Incident.

OC3.4.6 If the notification provided under Sections OC3.4.4.1 or OC3.4.5.1 is given by telephone, by the User to the DWTSO or by the DWTSO to the affected Users, as the case may be, such notification shall be recorded as received by the recipient, and confirmed in writing by the notice provider, at the earliest possible time.

OC3.4.7 No later than one (1) hour after having received a notification under Section OC3.4.4.1, the DWTSO shall inform the notice provider by electronic
means or facsimile of whether the DWTS has been affected by the Incident.

OC3.4.8 No later than one (1) hour after having received a notification under Section OC3.4.5.1, each User shall inform the DWTSO by electronic means or facsimile of whether its Facility has been affected by the Incident.

OC3.4.9 Assessment of the Incident by the DWTSO

OC3.4.9.1 Upon the DWTSO becoming aware of an Incident (by virtue of Sections OC3.4.4.1 or OC3.4.5.1), the DWTSO shall immediately assess the Incident. The assessment of the Incident shall be documented by the DWTSO, and shall address the following issues:

(a) the type and nature of the Incident;
(b) the User or Users that caused the Incident;
(c) whether the DWTSO caused the Incident;
(d) the affected Users as a result of the Incident;
(e) the impact on the DWTS and the Facilities;
(f) the resulting risks of the Incident;
(g) the remedial measures carried out, or to be carried out, in relation to the Incident; and
(h) whether the Incident can be classified as a Significant Incident in accordance with Section OC3.5.

OC3.4.9.2 Notification to affected Users of assessment

(a) After having assessed an Incident under Section OC3.4.9.1, the DWTSO shall notify each affected User of the results of the assessment under Section OC3.4.9.1.

(b) This notification shall be provided by the DWTSO to the affected Users by electronic means or by facsimile at the earliest possible time but not later than one (1) Day after the assessment results are available to the DWTSO, to prevent any further impact on the Facilities of the affected Users.

OC3.4.10 Remedi  

OC3.4.10.1 Each User or the DWTSO, as the case may be, is responsible to carry out all remedial measures (as identified under Section OC3.4.9.1) to remedy the effects of the Incident as follows:

(a) each User shall be responsible for the remedial measures required in relation to its Facilities; and

(b) the DWTSO shall be responsible for the remedial measures required in relation to the DWTS.

OC3.4.10.2 The DWTSO shall be responsible for the coordination and control of the remedial measures required to be performed in accordance with Section OC3.4.10.1.
OC3.4.11  Second notification to be provided by the relevant User or the DWTSO in relation to the Incident

OC3.4.11.1  Where:

(a)  a Facility has been affected, the relevant User shall provide to the DWTSO a second notification (in response to the notification provided under Section OC3.4.4.1); and

(b)  the DWTS has been affected, the DWTSO shall provide to the affected Users, a second notification (in response to the notification provided under Section OC3.4.5.1),

as the case may be, providing a progress update on the notification provided under Sections OC3.4.4.1 or OC3.4.5.1, as the case may be, including an update on the extent of compliance of the relevant User or the DWTSO, as the case may be, with any findings made by the DWTSO in the assessment conducted under Section OC3.4.9.1, and also including:

(c)  the expected or observed extent of any effects of the Incident;

(d)  the assumed effects on the Facility or the DWTS, as the case may be, of the Incident;

(e)  the remedial measures that have been carried out, or are planned to be carried out, in relation to the Incident;

(f)  the steps taken by the relevant User or the DWTSO, as the case may be since being notified of the Incident;

(g)  the time estimated to restore the Facilities or the DWTS, as the case may be, to normal operation.

OC3.4.11.2  The second notification provided under Section OC3.4.11.1 shall be provided, as the case may be, by:

(a)  the relevant User to the DWTSO, no later than one (1) Day after such User has been provided with the notification under Section OC3.4.9.2.

(b)  the DWTSO to the affected Users, no later than (1) Day after the completion of the assessment under Section OC3.4.9.1.

OC3.4.12  Review by the DWTSO of second notification

OC3.4.12.1  The DWTSO shall:

(a)  review the notification provided by the relevant User under Section OC3.4.11.1(a); or

(b)  re-consider the notification provided by it under Section OC3.4.11.1(b),

to assess, within a period of three (3) Days after either the receipt of the notification from the relevant User under Section OC3.4.11.1(a) or the provision of the notification by the DWTSO under Section OC3.4.11.1(b), as the case may be, whether the information provided, and in particular the steps taken and remedial measures planned, are appropriate to ensure that the normal operation of the Facilities and the DWTS, as the case may be, is restored as soon as possible.
OC3.4.12.2 If, as a result of the assessment under *Section OC3.4.12.1*, the DWTSO determines that the relevant User has not taken appropriate steps or remedial measures to restore normal operation of the Facilities, the DWTSO shall instruct, no later than three (3) Days after the completion of the assessment under *Section OC3.4.11.1*, further steps or measures for the relevant User to implement. Such further steps or measures shall be carried out by the relevant User in accordance with the DWTSO’s instructions.

OC3.4.12.3 If, as a result of the assessment under *Section OC3.4.12.1*, the DWTSO determines that the steps or remedial measures taken by the DWTSO have transpired to not be appropriate to restore normal operation of the DWTS, the DWTSO shall take such further steps or measures that are reasonably necessary to restore normal operation of the DWTS.

OC3.4.12.4 The DWTSO shall review and coordinate the remedial measures until the normal operation of the Facilities or the DWTS, as the case may be, has been restored.

OC3.4.13 Notification of normal operation

OC3.4.13.1 The User that has caused the Incident shall notify the DWTSO as soon as possible after normal operation of the Facility has been restored. The notification shall be provided in writing within two (2) Days of the restoration of normal operation of the Facility, and shall comprise the following information:

(a) a brief description of the Incident (which may simply be a reference to the relevant notices provided);

(b) the time at which normal operation has been restored;

(c) the remedial measures that proved to be effective; and

(d) the preventive measures planned to be implemented to prevent similar or identical Incidents in the future.

OC3.4.13.2 Each affected User (as notified under *Section OC3.4.9.1*) shall notify the DWTSO as soon as normal operation has been restored at its Facility. A final notification shall be submitted to the DWTSO within two Days of normal restoration being restored, and shall comprise the following information:

(a) the time at which the normal operation had been restored; and

(b) the remedial measures that proved to be effective.

OC3.4.13.3 The DWTSO shall:

(a) notify all affected Users (as notified under *Section OC3.4.9.1*) as soon as it is notified by all affected Users under *Section OC3.4.13.2*;

(b) notify all affected Users as soon as normal operation of the DWTS is restored;

(c) review the notifications provided under *Sections OC3.4.13.1 and OC3.4.13.2*, and determine whether any modifications are required to the SWDC; and
(d) if required under any applicable law or regulation, notify ECRA and MOWE of the Incident.

**OC3.5 SIGNIFICANT INCIDENT**

**OC3.5.1** If the DWTSO determines that the Incident can be classified as a:

(a) **Water Contamination Incident**;  
(b) **Water Production Incident**; or  
(c) **Water Transmission Incident**,  
the DWTSO shall declare the Incident to be a Significant Incident, and shall notify that affected User of this determination as soon as possible.

**OC3.5.2 Significant Incident Report**

**OC3.5.2.1** Either the User or the DWTSO, as the case may be, which caused the Significant Incident, shall prepare a Significant Incident Report. The Significant Incident Report shall include the following:

(a) who caused the Significant Incident;  
(b) the time and location of the Significant Incident;  
(c) the Facility or the DWTS directly involved (not merely affected by the event), including the tag numbers and description of the particular equipment;  
(d) the description of the Significant Incident, including the probable causes and any injuries to individuals or damage to the Facilities and the DWTS;  
(e) the operational logs to support the description of the Significant Incident;  
(f) the remedial measures that proved to be effective;  
(g) the time at which normal operation had been restored;  
(h) the preventive measures planned to be implemented to prevent similar or identical Incidents in the future;  
(i) the amount of water lost; and  
(j) any other relevant information.

**OC3.5.2.2** Where the Significant Incident has been caused by a User, the DWTSO shall review the Significant Incident Report, confirm that it complies with the SWDC requirements and submit it to ECRA.

**OC3.5.2.3** Where the Significant Incident has been caused by the DWTSO, the DWTSO will prepare the Significant Incident Report and submit it to ECRA.

**OC3.5.3 Evaluation of Significant Incidents**

**OC3.5.3.1** The DWTSO shall maintain an indexed record of all Significant Incident Reports and shall review each report to determine whether the DWTSO and the Users have complied with the SWDC.
OC3.5.3.2 Every **Year**, or any other period to be agreed upon with **ECRA**, the **DWTSO** shall produce a report listing and commenting on the **Significant Incidents** occurred in the last period. The summary shall draw specific attention to any lack of compliance with the **SWDC** and to any areas where there may be a need to modify the **SWDC**.

OC3.5.3.3 The **DWTSO** shall subsequently make its recommendations, including proposed modifications to the **SWDC** arising from its review of **Significant Incident Reports**.
OPERATION CODE 4: WATER QUALITY

OC4.1 INTRODUCTION

OC4.1.1 This Operation Code 4 – Water Quality addresses:

(a) Transmitted Water Quality;
(b) the Online Monitoring System;
(c) sampling of Water, Transmitted Water and Desalinated Water;
(d) the storage of monitoring and sampling results, and the reporting in relation to these results; and
(e) the procedure in the event of a Water Quality Failure.

OC4.2 OBJECTIVE

OC4.2.1 This Operation Code 4 – Water Quality is intended to ensure that

(a) the Desalinated Water produced by each DWP and delivered to the DWTS or to each facility of a PCC, as the case may be, and
(b) the Water delivered by each NSPO to the DWTS.

is of Transmitted Water Quality so as to ensure that any water supplied to the WDSO or the PCC, as the case may be, is of suitable quality and to avoid any risk to health should such water be consumed.

OC4.3 SCOPE

OC4.3.1 This Operation Code 4 - Water Quality applies to the DWTSO and to the following Users:

(a) DWP;
(b) NSPO; and
(c) WDSO.

OC4.4 TRANSMITTED WATER QUALITY

OC4.4.1 Each Water Producer must ensure that the water produced and delivered to the DWTS and to each facility of a PCC, as the case may be, is of Transmitted Water Quality.

OC4.4.2 The DWTSO must ensure that the water received by the DWTSO from each Water Producer is of Transmitted Water Quality.

OC4.4.3 The water produced and delivered by each Water Producer to the DWTS that is downstream of each Connection Point, will be deemed to be of Transmitted Water Quality, unless each WDSO or the DWTSO, as the case may be, can demonstrate that such water is not of Transmitted Water Quality.
**OC4.5** **PROCEDURES FOR MONITORING**

OC4.5.1 Each *Water Producer* shall, in accordance with *Appendix OC4-App.2.1.1*, continuously monitor the quality of the *Desalinated Water* or *Water*, as the case may be, it produces and delivers to the *DWTS* or the facility of any *PCC*, as the case may be, by using the *Online Monitoring System* immediately upstream of the relevant *Connection Point*.

OC4.5.2 The *DWTSO* shall, in accordance with *Appendix OC4-App.2.1.2*, continuously monitor the quality of the *Transmitted Water* it delivers to the *WDS*, by using the *Online Monitoring System* immediately upstream of the relevant *Connection Point*.

OC4.5.3 Without limiting *Section OC4.7*:

(a) each *Water Producer* shall provide to the *DWTSO*; and  
(b) the *DWTSO* shall provide to each *WDSO*,  
in real time, the data from its *Online Monitoring System* at the relevant *Connection Point*.

**OC4.6** **PROCEDURES FOR SAMPLING**

OC4.6.1 Each *WDSO* and the *DWTSO* shall monitor the quality of water it receives from each *Water Producer* by taking samples of such water in accordance with *OC4-App.2.1.2*.

OC4.6.2 Without limiting *Section OC4.7*:

(a) each *WDSO* shall provide to the *DWTSO*; and  
(b) the *DWTSO* shall provide to each *Water Producer*,  
the results of the sample analysis conducted in accordance with *Section OC4.6.1*, within two (2) *Days* of the results of the analysis being prepared by each *WDSO* or the *DWTSO*, as the case may be.

**OC4.7** **DATA STORAGE AND REPORTS**

OC4.7.1 The data results of any monitoring of water under *Section OC4.5* and the sample result of any sampling of water under *Section OC4.6*, shall be stored and archived at the premises of each *Water Producer*, *WDSO* or the *DWTSO*, as the case may be, for a period of not less than five (5) *Years* from the relevant date of creation of the monitoring or sampling results.

OC4.7.2 Each *User* shall, prior to the end of March each *Year*, prepare and submit to the *DWTSO*, a report summarizing any monitoring and sampling results that it has obtained, in relation to the preceding *Year*.

OC4.7.3 The *DWTSO* shall submit to *ECRA*: 

(a) the reports it receives under Section OC4.7.2; and
(b) its own annual report on water quality, which shall include information on the Water Quality Failure provided by the User under Section OC4.8.5, prior to the end of April each Year.

**OC4.8 WATER QUALITY FAILURE**

**OC4.8.1** Should a User determine a Water Quality Failure, it shall immediately notify the DWTSO of such occurrence.

**OC4.8.2** The notification under Section OC4.8.1 must contain the following details to enable the DWTSO to indentify the origin of the Water Quality Failure, and to assess the implications, risks and required remedial actions:

(a) the name of the User, including the name and contact details of the individual making the notification;
(b) the time and location of the Water Quality Failure;
(c) the nature of the Water Quality Failure. The User need not state the cause of the Water Quality Failure, but must describe the Water Quality Failure in sufficient detail to enable the DWTSO to reasonably consider and assess the implications and risks arising from the Water Quality Failure;
(d) the expected or observed extent of any effects of the Water Quality Failure; and
(e) the prompt remedial measures that have been carried out.

**OC4.8.3** The DWTSO shall assess any Water Quality Failure as soon as it:

(a) receives a notification under Section OC4.8.1; or
(b) determines itself a Water Quality Failure.

**OC4.8.4** The DWTSO shall:

(a) inform all affected Users about such Water Quality Failure as soon as the DWTSO identifies that such Users are affected; and
(b) investigate the Water Quality Failure and identify the User that caused the Water Quality Failure.

**OC4.8.5** Once the DWTSO has determined the identity of the User that caused the Water Quality Failure, and notified such affected Users in accordance with Section OC4.8.4, within one (1) Day of receipt of such notice, the User which caused the Water Quality Failure (as identified in the notice under Section OC4.8.4) shall submit a comprehensive report to the DWTSO, covering the following information:

(a) the time and location of the Water Quality Failure;
(b) the nature of the Water Quality Failure;
(c) the reason for the Water Quality Failure;
(d) the prompt remedial and additional mitigation measures taken and/or proposed in relation to the **Water Quality Failure**;

(e) the extent of possible impact on the **Transmitted Water** downstream of where the **Water Quality Failure** occurred;

(f) the measures to be applied to avoid a repetition of the **Water Quality Failure**; and

(g) the time estimated for restoration of normal operation.
OC4-APPENDIX 1   TRANSMITTED WATER QUALITY

OC4-App.1.1    For water produced and delivered to the DWTS by a Water Producer to be classified as being of Transmitted Water Quality, such water shall satisfy both, the specifications and standards as provided for in the Sections OC4-App.1.1.1 and OC4-App.1.1.2:

OC4-App.1.1.1 Specifications:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Symbol</th>
<th>Unit</th>
<th>Allowed Range*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature</td>
<td>T</td>
<td>°C</td>
<td>20 ~ 40</td>
</tr>
<tr>
<td>pH</td>
<td>-</td>
<td>-</td>
<td>8.1 ~ 8.6</td>
</tr>
<tr>
<td>Calcium Hardness</td>
<td>CaH</td>
<td>mg/L as CaCO₃</td>
<td>40 ~ 50</td>
</tr>
<tr>
<td>Total Alkalinity</td>
<td>TA</td>
<td>mg/L as CaCO₃</td>
<td>40 ~ 50</td>
</tr>
<tr>
<td>Sulfate</td>
<td>SO₄</td>
<td>mg/L</td>
<td>Max. 2</td>
</tr>
<tr>
<td>Iron</td>
<td>Fe</td>
<td>mg/L</td>
<td>Max. 0.05</td>
</tr>
<tr>
<td>Copper</td>
<td>Cu</td>
<td>mg/L</td>
<td>Max. 0.05</td>
</tr>
<tr>
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<td>RCl</td>
<td>mg/L</td>
<td>0.2 ~ 0.5</td>
</tr>
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<td>Turbidity</td>
<td>-</td>
<td>NTU</td>
<td>Max. 1</td>
</tr>
<tr>
<td>Total Dissolved Solids</td>
<td>TDS</td>
<td>mg/L</td>
<td>Max. 130</td>
</tr>
<tr>
<td>Langelier Saturation Index</td>
<td>LSI</td>
<td>-</td>
<td>0.1 ~ 0.3</td>
</tr>
</tbody>
</table>

OC4-App.1.1.2 Standards:


OC4-App.1.1.3 Should any of the specifications and standards in OC4-App.1.1 conflict, the most stringent requirements shall prevail to the extent of any inconsistency.

OC4-APPENDIX 2   ONLINE MONITORING SYSTEM AND SAMPLING

OC4-App.2.1 Online Monitoring System

OC4-App.2.1.1 Each Water Producer shall continuously operate its Online Monitoring System, and shall collect and compute the following parameters of the water that it produces, at its Seawater Desalination Plant or NSPs, as the case may be:

the temperature;
the pH-value;
the conductivity;
the alkalinity;
the turbidity;
the residual chlorine;
the total dissolved solids; and
the Langelier Saturation Index.

OC4-App.2.1.2 The DTWSO shall continuously operate its Online Monitoring System, and shall collect and compute the following parameters of the water received by the DTWS from the Water Producers:

(a) the temperature;
(b) the pH-value;
(c) the conductivity;
(d) the alkalinity; and
(e) the residual chlorine.

OC4-App.2.1.3 The Online Monitoring System shall be appropriately operated and maintained according to the manufacturer’s instructions.

OC4-App.2.1.4 The Users and the DWTSO shall make all effort to acquire the most accurate data.

OC4-App.2.1.5 Each item of equipment of the Online Monitoring System shall be calibrated regularly and frequently according to the manufacturer’s requirements.

OC4-App.2.2 Sampling

OC4-App.2.2.1 Each WDSO that receives water from the DWTSO at the Connection Point shall take samples at the sampling point downstream of the relevant Connection Point in accordance with the relevant SASO, APHA, AWWA, WEF and the US EPA standards.

OC4-App.2.2.2 The DWTSO receiving water from each Water Producer at the Connection Point shall take samples at the sampling point downstream of the relevant Connection Point in accordance with the SASO, APHA, AWWA, WEF and US EPA standards.

OC4-App.2.2.3 The number of samples to be taken by each WDSO and the DWTSO, as the case may be, shall be determined for each Connection Point in accordance with the SASO and US EPA standards.

OC4-App.2.2.4 The DWTSO may take any additional number of samples at the Connection Points between the NSPs and the DWTS, should the DWTSO determine that such water may not be in compliance with the Transmitted Water Quality.

OC4-App.2.2.5 The analysis of the water samples by each WDSO and the DWTSO shall be carried out according to the Standard Methods for Examination of Water and Wastewater immediately after the samples have been taken by a laboratory certified according to ISO 9000 standards.

OC4-App.2.2.6 Additional procedures covering more serious and widespread water contamination are included in Operation Code 5 - Transmission System Disruption.
OPERATION CODE 5:  

**TRANSMISSION SYSTEM DISRUPTION**

**OC5.1  INTRODUCTION**

**OC5.1.1** A *Significant Incident* may occur that causes a *TSD* to the *DWTS* and results in a disruption to the supply of *Transmitted Water* to any *WDSO*.

**OC5.1.2** This Operation Code 5 - *Transmission System Disruption* provides the procedure for the *DWTSO* and each *User* in the event of a *TSD*, including:

(a) the responsibilities of the *DWTSO* and each *User* in the event of a *TSD*;

(b) the development of an emergency plan and manual of operating procedures by the *DWTSO*, and the access of each *User* to this plan and procedures; and

(c) the procedure to be implemented should the demand by any *WDSO* for *Transmitted Water*, not be able to be met as a result of a *TSD*.

**OC5.2  OBJECTIVE**

**OC5.2.1** The objective of this Operation Code 5 - *Transmission System Disruption* is to set forth the requirements for the *DWTSO* to develop procedures and plans to apply in the event of a *TSD* and to ensure that each *User* complies with such procedures and plans:

(a) so that normal operation of the *DWTS* is restored in the shortest possible time after a *TSD* has occurred; and

(b) to minimise any disruption of supply of *Transmitted Water* to each *WDSO* or *PCC*, as the case may be.

**OC5.3  SCOPE**

**OC5.3.1** This Operation Code Part 5 - *Transmission System Disruption* applies to the *DWTSO* and to the following *Users*:

(a) *DWP*; 

(b) *NSPO*; and

(c) *WDSO*.

**OC5.4  TSD PROCEDURE**

**OC5.4.1** The *DWTSO* shall be responsible for co-ordinating all actions, responses, operations and procedures in the event of a *TSD*.

**OC5.4.2** Each *User* shall abide by the instructions issued by the *DWTSO* under *Section* OC5.4.1 in relation to a *TSD*. 
OC5.4.3 Following a TSD, any scheduling and dispatch of Desalinated Water in accordance with the Scheduling and Dispatch Code may be suspended until the DWTSO determines that normal scheduling and dispatch procedures can be restored.

OC5.4.4 The complexities of any restoration of normal operation to the DWTS in the event of a TSD will require a flexible approach from the DWTSO, and therefore, it is not possible for the DWTSO to set out a detailed specific or rigid procedure or operational sequence in the event of a TSD.

OC5.4.5 If it is determined by the DWTSO that it must isolate certain parts of the DWTS whilst restoration work is carried out in relation to the DWTS, the DWTSO shall use its best endeavours to:

(a) isolate as little as possible of the DWTS;
(b) ensure that maximum integration of the DWTS is achieved despite the isolation of certain parts of the DWTS; and
(c) cause the least possible disruption to the DWTS.

OC5.4.6 If a User is unable to comply with the instructions issued by the DWTSO under Section OC5.4.1, that User shall notify the DWTSO so that the DWTSO may:

(a) consider issuing revised instructions to that User; or
(b) provide conditions within the DWTS that may enable that User to comply with the instructions issued by the DWTSO.

OC5.4.7 The DWTSO shall notify each User when normal operation of the DWTS has been resumed following a TSD.

OC5.5 EMERGENCY PLAN AND MANUAL OF EMERGENCY OPERATING PROCEDURES

OC5.5.1 Based on the System Studies as described in Section 0 of the Planning Code, the DWTSO shall prepare an emergency plan. This emergency plan shall be provided to each User, and shall be updated by the DWTSO from time to time to provide for any developments to the DWTS or the Facilities, to the extent that it is informed of the developments to the Facilities.

OC5.5.2 The emergency plan shall include the following:

(a) a summary sheet – general information on the contingency plan;
(b) a decision flow chart – which shall identify the process by which a contingency plan is selected for use depending on the TSD;
(c) an action plan – including a step by step summary of actions to be taken to resolve issues and re-instate supply;
(d) procedures – providing specific details of activities identified in the action plan;
(e) plan - specific information offering essential information for those managing the event, for example consumers affected, volumes not supplied, location and availability of materials;

(f) pumping station and valves arrangements – including details and timings of operations to be performed;

(g) contact details – listing details of all personnel to be contacted whilst implementing the contingency plan;

(h) time line – complete with program of work to be undertaken and the expected duration until re-instatement; and

(i) network schematic – depicting location plan(s) of the area with relevant valves, pumping stations and pipelines identified.

OC5.5.3 In addition to the above, the emergency plan shall state:

(a) the date at which the plan was originally produced;

(b) the date it was revised and the version number; and

(c) the scenario description and location, where appropriate, shall be included.

OC5.5.4 A manual of emergency operating procedures shall also be developed by the DWTSO in consultation with each User. This manual of emergency operating procedures shall be provided to each User, and shall be updated by the DWTSO from time to time to provide for any developments to the DWTS or the Facilities.

OC5.5.5 If an event occurs which is not provided for in the emergency plan or manual of emergency operating procedures, the procedures to be applied by the DWTSO and each User shall be determined by the DWTSO at that time.

OC5.5.6 As part of the manual of emergency operating procedures, the DWTSO shall maintain a complete set of essential technical and operational documents for the DWTS and each Seawater Desalination Plant.

OC5.5.7 Subject to any procedures agreed between the DWTSO and each User to ensure adequate security, copies of the emergency plan and the manual of emergency operating procedures shall be maintained by the DWTSO at a location to be notified by the DWTSO to each User.

OC5.6 TRANSMITTED WATER DEMAND

OC5.6.1 Where the demand of each WDSO for Transmitted Water, cannot be met in whole, or in a part, as a result of an event of TSD, the DWTSO shall control the delivery of the Transmitted Water to each WDSO in accordance with a schedule to be prepared by the DWTSO and approved in advance by ECRA, applying, for example, pre-planned time water rationing or pre-planned time disconnection.

OC5.6.2 The schedule to be prepared by the DWTSO as per Section OC5.6.1 shall contain sequential steps of water rationing in the DWTS or arts thereof and
sequential steps in disconnection User from the DWTS to maintain the supply of Transmitted Water to the User with highest priority as long as possible in the event of a TSD.
OPERATION CODE 6:  **START-UP AND SHUTDOWN PROCEDURES**

**OC6.1 INTRODUCTION**

**OC6.1.1**  A Facility may be disconnected from the DWTS at a Connection Point and may later be re-connected to the DWTS.

**OC6.1.2**  Such a process requires the safe operation of equipment by the DWTSO and each User at the DWTS and the Facility during the shut down operations and later start-up operations.

**OC6.1.3**  Each User and the DWTSO must ensure that the water is of Transmitted Water Quality prior to:

(a) re-engage or connect its relevant Facility to the DWTS; and

(b) water being supplied from either a Seawater Desalination Plant or a NSP, as the case may be, to the DWTS or from the DWTS to a WDS, as the case may be.

**OC6.2 OBJECTIVE**

**OC6.2.1**  The objective of this Operation Code 6 - Start-Up and Shutdown Procedures is to provide operation procedures for pumps, valves and associated systems to be followed by the DWTSO and each User at the DWTS and the Facilities, as the case may be, in order to ensure safety during the shutdown and start-up operations.

**OC6.3 SCOPE**

**OC6.3.1**  This Operation Code 6 - Start Up and Shutdown Procedures applies to the DWTSO and to the following Users:

(a) DWPs;

(b) PCC;

(c) NSPOs; and

(d) WDSOs.

**OC6.4 START-UP AND SHUTDOWN PROCEDURES**

**OC6.4.1**  The DWTSO shall design a routine start-up and shut-down procedure of pumps, valves and associated systems for the DWTS, so as to prevent:

(a) damage to the DWTS; and

(b) unstable operations in connection with the DWTS.
Each User shall design a routine start-up and shut-down procedure of pumps, valves and associated systems for its Facility, so as to prevent:

(a) damage to its Facility; and

(b) unstable operation conditions in connection with its Facility.

It shall be ensured by the DWTSO and each User, as the case may be, that any positive or negative pressure transients generated as a result of pump and valve start-up or shut-down operations are maintained within the rated working pressures of the connected DWTS or Facility, as the case may be.

The DWTSO and each User, as the case may be, shall verify the suitability of its design of its routine pump and valve start-up and shut-down procedures, by conducting a hydraulic study, to be carried out in accordance with Good Industry Practice.

The DWTSO and each User shall specify its routine pump and valve start-up and shut-down procedure in its Operating and Maintenance Manual.

Should a situation arise where it is necessary for the DWTSO or a User, as the case may be, to operate a pump or a valve in a manner other than as set out in the Operating and Maintenance Manual, then, as the case may be:

(a) the DWTSO shall advise each affected User in advance of such an operation, and shall request that each affected User confirms that it agrees to such operations; or

(b) each User shall advise the DWTSO in advance of such an operation, and shall request that the DWTSO confirm that it agrees to such operation.

Any agreement to be provided by the DWTSO or an affected User under Section OC6.5.2, must not be unreasonably denied.

Following any operations performed in relation to the DWTS or a Facility, as the case may be, the equipment used by the DWTSO or the User, as the case may be, shall be flushed and disinfected by the DWTSO or such User, as the case may be, prior to commencing any new operations, in particular, if any personnel of the DWTSO or the User, as the case may be, has accessed interior parts of the DWTS or the Facility.

Each User and the DWTSO must ensure that the water is of Transmitted Water Quality prior to:

(a) re-engaging the connection of a Facility to the DWTS; and
(b) water being supplied from either a Seawater Desalination Plant or a NSP, as the case may be, to the DWTS or from the DWTS to a WDS, as the case may be.

OC6.6.3 Any stagnant water remaining in any part of the DWTS or a Facility, as the case may be, shall be tested in relation to bacterial contamination by either the DWTSO or the relevant User.

OC6.6.4 Contaminated water shall be removed from the DWTS or a Facility, as the case may be, by the relevant User or DWTSO, prior to commencing any new operations of the Facilities or the DWTS.
WATER METERING CODE

WM.1 INTRODUCTION

WM.1.1 All Transmitted Water transferred at a Connection Point must be metered and recorded using the Water Metering System. This Water Metering Code sets out:

(a) the installation, operation, technical requirements, commissioning and testing and adjustment, repair, recalibration or replacement of the Water Metering Systems, and the exchange of Water Meter Data;

(b) the calibration and testing of the Water Meters; and

(c) the security and registration of the Water Meter Data.

WM.2 OBJECTIVE

WM.2.1 The objective of this Water Metering Code is to establish:

(a) the requirements for the metering of water at the Connection Point;

(b) the standards and specifications to be met by each User and the DWTSO for the operation and maintenance of the Water Metering Systems; and

(c) each User and the DWTSO’s responsibilities in relation to the operation, maintenance and management of the Water Metering Systems and Water Meters, as well as the use, communication and exchange of Water Meter Data between each User and the DWTSO.

WM.3 SCOPE

WM.3.1 This Water Metering Code applies to the DWTSO and to the following Users:

(a) DWPs;

(b) NSPOs; and

(c) WDSOs.

WM.4 OTHER METERING REQUIREMENTS

WM.4.1 Any water metering requirements set out in separate agreements between:

(a) respective Users; or

(b) the DWTSO and a User,

shall apply in addition to this SWDC, provided that such other water metering requirements do not conflict with this SWDC. In the event of any inconsistency, the terms of this SWDC shall prevail to the extent of any inconsistency.
WM.5 WATER METER DATA

WM.5.1 At each Connection Point, main and backup Water Metering Systems, including Water Meters, shall be installed by the relevant Water Metering System Owner in accordance with the requirements set out in the Connection Code.

WM.5.2 Each Water Metering System shall be operated and maintained by the relevant Water Metering System Owner, who shall read the Water Meter, and check, validate and record the Water Meter Data.

WM.5.3 The Water Meter Data shall be exchanged between the DWTSO and each User, as the case may be, and shall be prepared in a way to enable the archiving of the Water Meter Data in a comprehensive and accurate manner.

WM.6 TECHNICAL REQUIREMENTS OF THE WATER METERS AND THE WATER METERING SYSTEM

WM.6.1 All Water Meters and/or Water Metering Systems must comply with the technical requirements specified in CC-Appendix 5 to the Connection Code.

WM.7 WATER METERING SYSTEM

WM.7.1 At each Connection Point the main Water Metering System and the backup Water Metering System shall be operated simultaneously by the relevant Water Metering System Owner.

WM.7.2 The main Water Metering System shall be used primarily for the measurement of the Transmitted Water volume passing the relevant Connection Point.

WM.7.3 The backup Water Metering System shall be used for verification of the readings of the main Water Metering System.

WM.7.4 The backup Water Metering System shall also be used for measuring the Transmitted Water volume passing the Connection Point in periods where the main Water Metering System is

(a) out of service; or

(b) not reading accurate data.

WM.7.5 The Water Metering System shall be operated and maintained by each User or the DWTSO, as the case may be, in accordance with its relevant manufacturer’s operating and maintenance guidelines or as otherwise necessary for the Water Meter System Owner to comply with its obligations under this SWDC.

WM.7.6 Prior to commencing maintenance works on the Water Metering System or a Water Meter, the Water Metering System Owner shall inform the relevant User or the DWTSO about such works.
COMMISSIONING OF THE WATER METERING SYSTEM

WM.8.1 Commissioning tests shall be carried out by the relevant Water Metering System Owner on its maintained, repaired or new Water Metering System to ensure that accurate Water Meter Data can be provided before the Water Metering System is put in service after maintenance, repair or replacement.

WM.8.2 Following commissioning, the Water Metering System Owner shall provide such evidence that the relevant parties may require, confirming that the Water Metering System meets the requirements of this SWDC.

PERIODIC CALIBRATION AND TESTING OF WATER METERS

WM.9.1 In accordance with the guidelines of the Water Meter manufacturer, periodic calibration tests of all Water Meters shall be undertaken by the Water Metering System Owner of such Water Meter.

WM.9.2 The tests shall be performed in accordance with the relevant manufacturer’s guidelines and any relevant IEC or ISO standards and shall confirm that meter accuracy is within the limits stated in Section CC-App.5.2.

WM.9.3 The calibration records shall be uniquely identifiable, kept in a safe place and recording the key details, including:
(a) the identification number and the date;
(b) the names and status of the authorized testing persons; and
(c) the calibration results.

WM.9.4 The Water Meters shall be tested in accordance with Good Industry Practice at intervals not exceeding 2 years.

WM.9.5 Water Meters shall also be tested if the main Water Metering System and backup Water Metering System at a Connection Point diverge by more than 1.5 times the limit of error associated with the accuracy given in Section CC-App.5.2.

WM.9.6 Complete and accurate records of tests, work carried out and pertinent data to confirm successful testing and calibration in accordance with the requirements of this SWDC shall be kept by the Water Metering System Owner and promptly registered.

WM.9.7 All Water Meters shall be regularly re-calibrated at intervals not exceeding 2 years.

SUSPECTED METERING ERRORS

WM.10.1 If any item of a Water Metering System is suspected of performing incorrectly, each affected User or the DWTSO, as the case may be, may request the Water Metering System Owner to carry out accuracy tests to confirm the correct operation and accuracy of the Water Metering System.

WM.10.2 The Water Metering System Owner shall carry out any accuracy test requested in accordance with Section WM.10.1.
WM.10.3 The relevant User or the DWTSO, as the case may be, that requested the accuracy test in accordance with Section WM.10.1 shall bear the costs of such testing if the Water Meter is found to be operating within the prescribed accuracy, otherwise the cost of the test shall be borne by the Water Metering System Owner.

WM.10.4 Each affected User or the DWTSO, as the case may be, shall be given 24 hours notice of such tests and be invited to witness the tests. Accuracy test results shall be made available promptly and in writing to each affected User or the DWTSO, as the case may be.

WM.10.5 Certified testing equipment and reference standards must be traceable to recognized national or international standards, and shall be used in such tests and if, by agreement, it is deemed necessary, an ISO certified independent laboratory may be employed to certify such tests.

WM.10.6 Where an accuracy test indicates that an error exceeds the limit of errors associated with the accuracy given in this SWDC, then such error shall be recorded prior to adjusting, repairing or renewing the Water Metering System, or part thereof, or replacing defective components.

WM.10.7 The Water Metering System shall be restored to service and proved to be operating within the prescribed limits of accuracy as soon as is reasonably practicable.

WM.10.8 Upon the completion, examination, maintenance, repair, recalibration or replacement of any component in the Water Metering System, the Water Metering System shall be sealed jointly by the DWTSO and the relevant User.

WM.11 ADJUSTMENT, REPAIR, REPLACEMENT OR RECALIBRATION OF WATER METERING SYSTEM

WM.11.1 If the DWTSO or any User discovers upon performing a calibration test that any part of the Water Metering System is outside the accuracy limits set out in Section CC-App.5.2 or is otherwise not functioning properly, the Water Metering System Owner of the faulty Water Metering System must, at its own expense, adjust, repair, recalibrate or replace such part within 1 month of such calibration test.

WM.11.2 Prior to such adjustment, repair, recalibration or replacement, the DWTSO and each affected User shall agree on the use of the backup Water Metering System for the period where the main Water Metering System is out of service.

WM.11.3 Upon the completion of any adjustment, repair, recalibration or replacement of any part in of the Water Metering System, such Water Metering System must be resealed jointly by the DWTSO and the relevant User.
ADJUSTMENTS TO WATER METERING SYSTEM

WM.12.1 The DWTSO or affected User, as the case may be, shall make reasonable adjustments in accordance with Section WM.12.2 to the measured Water Meter Data during the periods, where:

(a) the DWTSO or affected User discovers that any seal at a Water Metering System is broken;
(b) any part of the Water Metering System fails to register;
(c) the results of a calibration test show that the measurement made by the relevant Water Metering System is outside the tolerance limits; or
(d) the comparison of the Water Metering Data with the measured data of the back-up metering system at the relevant Connection Point indicates that the Water Metering System is operating out of its tolerance limit.

WM.12.2 The adjustments to the Water Metering Data in relation to each period as per Section WM.12.1 shall be done by:

(a) such value as the DWTSO and each affected User may agree; or
(b) such value as is calculated:

(i) by correcting the error, if the percentage of error is ascertainable by calibration, tests or mathematical calculation which may be based on compared measurements of the backup Water Metering System; or
(ii) if the percentage of error is not ascertainable, by estimating on the basis of deliveries under similar conditions during the period since the last calibration test was performed on the Water Metering System.

WATER METER DATA SECURITY AND REGISTRATION

WM.13.1 Sealing

WM.13.1.1 The DWTSO and each affected User shall jointly seal the Water Metering System at the relevant Connection Point including data collection and exchange equipment.

WM.13.1.2 Only the Water Metering System Owner’s personnel may break such seals.

WM.13.1.3 Each other affected User shall be given at least forty-eight (48) hours' advance notice of the breaking of seals on any part of the Water Metering System. No such notice will be necessary when the breaking of a seal is necessitated by an emergency.

WM.13.1.4 Neither a User nor the DWTSO shall tamper or otherwise interfere with any part of the Water Metering System in any way. Where it is established that the Water Metering System has been tampered or interfered with, then until such tampering or interference has been rectified, the following should take place:
(a) the quantity measured or recorded shall be that measured or recorded by any other relevant installed Water Metering System; or

(b) if there is no other relevant Water Metering System or it is established to have been tampered or interfered with, the quantity shall be agreed by the affected User and the DWTSO or, in the absence of such agreement, the affected User or the DWTSO shall be entitled to refer the matter to ECRA for determination.

WM.13.1.5 If the Water Metering System Owner is not the Person who owns or controls the land on which the Water Meter or Water Metering System is situated, that Person (if bound by this SWDC) shall grant the Water Metering System Owner and all other Persons who require the same for the purposes of this SWDC sufficient rights of access for Water Metering System purposes and for the purposes of testing calibration, operation and maintenance and replacement of the Water Meter and Water Metering System.

WM.13.1.6 Where the DWTSO or any affected User requires a right of access or to deal in some other way with a Water Meter or Water Metering System for the purposes of this SWDC, all such necessary rights shall be granted by the affected User or the DWTSO with the power to grant them.

WM.13.1.7 All such rights shall be set down in the relevant Connection Agreement where this is practicable. The DWTSO and each affected User shall ensure that all reasonable arrangements and provisions are made and/or revised from time to time as and when necessary or desirable in accordance with Good Industry Practice to facilitate the safe exercise of any right of access.

WM.13.1.8 Local interrogation units may be used by authorized Users to interrogate the Outstations for the purposes of commissioning, maintenance/fault finding and when necessary the retrieval of stored Water Meter Data.

WM.13.2 Records

WM.13.2.1 Each Water Metering System Owner shall ensure that complete and accurate records of the operation and calibration of its Water Metering System are properly maintained.

WM.13.2.2 These records shall include, but not be limited to, the dates and results of any tests, readings, adjustments or inspection carried out and the dates on which any seal was applied or broken.

WM.13.2.3 The reasons for any seal being broken and the Persons, and their affiliations, attending any tests, readings, inspections or sealing shall be recorded.

WM.14 WATER METER DATA EXCHANGE

WM.14.1 Where this SWDC requires Water Meter Data to be exchanged between each affected User and the DWTSO, the Water Metering System Owners shall undertake Water Meter reading at the times required by this SWDC.

WM.14.2 If no time is specified for Water Meter reading to take place, the Water Meter reading shall take place as closely in time as possible to the time required in relation to the relevant Water Meter Data flow specified in this SWDC.
WM.14.3  All Water Meter Data shall include the synchronized times at which Water Meter reading took place.

WM.14.4  Where Water Meter Data is required for the purpose of this SWDC or relevant contracts referred to in this SWDC, the Water Meter Data shall be provided by making accurate readings of the relevant Water Meter, accurately recording the Water Meter Data arising from those readings and supplying that Water Meter Data to the DWTSO or each affected User, as the case may be, in accordance with the requirements of this SWDC.

WM.14.5  In the event of a data transmission unit or an Outstation failure, the Water Meter Data shall be marked accordingly, in order to indicate the possibility they are incorrect.

WM.15  WATER METER DATA STORAGE

WM.15.1  All Water Metering System Owners responsible for providing Water Meter Data in accordance with this SWDC shall retain a copy and a back up copy of the data in electronic format in accordance with the following Table Data Storage Requirements. The format of data to be stored shall be set out by the DWTSO and shall include the following parameters:

(a) the time period;
(b) the Water Meter identification number; and
(c) the Water Meter Data.

Table: Data storage requirements
<table>
<thead>
<tr>
<th>Data</th>
<th>Frequency of backup</th>
<th>Place of storage</th>
<th>Retained for</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current Day’s working data</td>
<td>End of each Day</td>
<td>with Water Metering System Owner</td>
<td>One complete week</td>
<td>Each Day’s back up stored separately</td>
</tr>
<tr>
<td>Current week’s working data</td>
<td>Each Thursday at the end of Day</td>
<td>One copy with User and one copy with DWTSO</td>
<td>One complete month</td>
<td>Each week’s back up stored separately</td>
</tr>
<tr>
<td>Current month’s working data</td>
<td>Each month at the end of the last Business Day</td>
<td>One copy with User and one copy with DWTSO</td>
<td>One complete year</td>
<td></td>
</tr>
<tr>
<td>Each month of finalised data</td>
<td>First Business Day of following month</td>
<td>One copy with User and one copy with DWTSO</td>
<td>Five Years</td>
<td>Finalized means all settlements agreed</td>
</tr>
<tr>
<td>One Year’s set of finalised data</td>
<td></td>
<td>One copy with User and one copy with DWTSO</td>
<td>Ten Years</td>
<td></td>
</tr>
</tbody>
</table>

WM.15.2 The **DWTSO** shall maintain a log in the form of electronic storage of digital data of all **Water Meter Data** for at least ten (10) complete **Years**.
SDC.1 INTRODUCTION

SDC.1.1 In order to:

(a) manage the demand for Desalinated Water of each WDS and
(b) avoid any overproduction of Desalinated Water,
each Seawater Desalination Plant and its Seawater Desalination Unit must be scheduled and dispatched in an appropriate manner.

SDC.1.2 This Scheduling and Dispatch Code sets out:

(a) the responsibilities and obligations of the DWTSO and each User with respect to the scheduling and dispatch of each Seawater Desalination Units;
(b) the requirements for setting up the DWTSO’s LDC function; and
(c) the procedures for the provision of timely and accurate data by each User to the DWTSO, the preparation of the day-to-day production and delivery schedule and the Dispatch Instructions.

SDC.2 OBJECTIVE

SDC.2.1 This Scheduling and Dispatch Code:

(a) sets out the provisions and procedures required to balance production, transmission and demand for Desalinated Water;
(b) ensures that the DWTSO receives sufficient information from each DWP and each WDSO to compile an optimized Desalinated Water dispatch program for day-to-day operations; and
(c) in addition to the normal day-to-day operations, it defines the procedures on how to communicate, process and integrate unscheduled events in the dispatch regime during the Schedule Day.

SDC.3 SCOPE

SDC.3.1 This Scheduling and Dispatch Code applies to the DWTSO and to the following Users:

(a) DWPs; and
(b) WDSOs.

SDC.4 LOAD DISPATCH CENTRE (LDC)

SDC.4.1 The DWTSO shall be responsible for:

(a) performing the LDC function; and
(b) coordination of communication between each User and the DWTSO in relation to the dispatch of Desalinated Water from the DWTS to each User, during each period of the Schedule Day and the Dispatch Day.
SDC.4.2 The DWTSO shall establish and maintain appropriate dispatch tools and communication devices which support its obligations in fulfilling the LDC function under this SWDC.

SDC.4.3 The DWTSO shall specify as part of its LDC function any special contact details, addresses and communication links to be used for the purpose of scheduling and dispatch as described in this SWDC and shall distribute such information to each User.

SDC.4.4 The DWTSO shall specify, as part of its LDC function, the format and communication protocols for the following data to be exchanged between the DWTSO and each User:

(a) the Availability Declaration;
(b) the Demand Notice;
(c) the production and delivery schedule required under Section SDC.8.1; and
(d) the Dispatch Instructions.

SDC.5 INFORMATION TO BE USED

SDC.5.1 The DWTSO shall compile day-to-day schedule data and Dispatch Instructions based on the available information from each DWP and WDSO, taking into account the following information:

(a) the Availability of each Seawater Desalination Plant and its Seawater Desalination Unit;
(b) the Operating Characteristics of each Seawater Desalination Plant;
(c) each WDSO demand forecast;
(d) the cost of production of Desalinated Water and transmission of such Desalinated Water to each WDS;
(e) any environmental restrictions;
(f) any restrictions due to Cogeneration and any other electricity supply restrictions notified to it;
(g) any fuel supply restrictions;
(h) the constraints and capabilities of the DWTS in relation to pumps and storage facilities; and
(i) the constraints and capabilities of each WDS.

SDC.6 AVAILABILITY DECLARATION

SDC.6.1 By 7:00 am each Day, each DWP shall submit to the DWTSO at least the data and information requested in Sections SDC.6.2, SDC.6.3, SDC.6.4 and SDC.6.5.

SDC.6.2 For each Seawater Desalination Unit of a Seawater Desalination Plant, an individual Availability Declaration in respect of each period of 1 hour for the whole of the Scheduled Day, in case any of the listed below parameters
has to be declared different from the previous Availability Declaration for the current Schedule Day:

(a) the Availability status of the Seawater Desalination Unit; and
(b) the condition where the Seawater Desalination Unit is not dispatched (one of the following):
   (i) cold (thermal process) or depressurized (membrane process);
   (ii) warm (thermal process);
   (iii) hot and evacuated (thermal process) or pressurized (membrane process); or
   (iv) in operation (for internal purposes, without being dispatched).

SDC.6.3 For each Seawater Desalination Unit of a Seawater Desalination Plant which has been declared as Available, any value of the Operating Characteristic of such Seawater Desalination Unit as set forth in SDC-Appendix 1 that is different from the previous notified Operating Characteristic:

(a) identifying the Operating Characteristic;
(b) stating the new value of the Operating Characteristic;
(c) specifying the time on the Schedule Day from when the new value will apply; and
(d) specifying the time on the Schedule Day for which the value is expected to be valid.

SDC.6.4 Any restrictions on operation which may arise from:

(a) environmental considerations;
(b) thermal energy supply restrictions;
(c) any fuel supply restrictions; or
(d) Cogeneration or any other electricity supply restrictions notified to it.

SDC.6.5 Any additional data or information that the DWTSO may request in individual cases to further optimize the scheduling and dispatch process.

SDC.6.6 Availability Declarations shall be made with respect to the capacities allocated to the DWTS only, any supply to any PCC shall not be included in the Availability Declaration.

SDC.6.7 Any data submitted with the Availability Declaration shall replace the previously submitted data. The currently registered Availability data may be requested from the DWTSO by each DWP.

SDC.6.8 Where no data or only some of the required data is submitted by each DWP to the DWTSO for a specific Seawater Desalination Plant or its Seawater Desalination Units, the DWTSO will assume that the last-submitted data or part thereof that has not been replaced in the submitted Availability Declaration is valid also for the following Schedule Day.
In accordance with Section SDC.4.4, the **Availability Declaration** shall be provided by the DWP to the DWTSO electronically in a format as specified by the DWTSO.

In the event of the failure of the electronic system for submitting data to the DWTSO, such data submissions may be made by facsimile.

The **DWTSO** shall confirm receipt of each **Availability Declaration** within 30 minutes by electronic means. If the receipt confirmation is not received by each DWP that issued the **Availability Declaration**, that party shall re-submit the data to the DWTSO and actively seek confirmation of receipt without delay.

**SDC.7 DEMAND NOTICE**

By 7:00 am each **Day**, each WDSO shall provide to the DWTSO in relation to each **Connection Point** for each hour during the following **Schedule Day**, a **Demand Notice** containing the following information:

(a) the hourly average volume flow of **Desalinated Water** to be withdrawn by that WDSO at the **Connection Point** from the DWTS; and

(b) the hourly peak volume flow of **Desalinated Water** to be withdrawn by that WDSO at the **Connection Point** from the DWTS.

In individual cases, the DWTSO may request additional data to further optimize the scheduling of **Transmitted Water** supply during the next Schedule Day.

Any data submitted with the **Demand Notice** shall replace the previously submitted data. The currently registered data submitted with the latest **Demand Notices** may be requested from the DWTSO by each WDSO.

Where no data, or only some of the required data is submitted by each WDSO to the DWTSO for a specific **Connection Point**, the DWTSO may take the demand forecast data provided by the relevant WDSO under Section OC1.4.2.1 OYOP for the relevant Schedule Day.

In accordance with Section SDC.4.4, the **Demand Notice** shall be provided by each WDSO to the DWTSO electronically in a format as specified by the DWTSO.

In the event of a failure of the electronic systems for submitting data to the DWTSO, data submissions may be made by facsimile.

The **DWTSO** shall confirm receipt of each **Demand Notice** within 30 minutes by electronic means. If the receipt confirmation is not received by each WDSO that issued the **Demand Notice**, that party shall re-submit the data to the DWTSO and actively seek confirmation of receipt without delay.

**SDC.8 SCHEDULING**

The **DWTSO** shall compile by 9:00 am each **Day**, a production and delivery schedule for the following **Schedule Day**. This schedule shall be valid for the following **Schedule Day** and be based on:
(a) the OYOP;
(b) the schedule of the current Dispatch Day;
(c) the Demand Notices provided by each WDSO; and
(d) the Availability Declarations provided by each DWP.

SDC.8.2 In accordance with Section SDC.4.4, this schedule for the following Schedule Day shall be distributed by the DWTSO to each User at 9:00 am each Day by electronic means in a format specified by the DWTSO.

SDC.9 DISPATCH

SDC.9.1 General

SDC.9.1.1 Based on the available information from each DWP and WDSO, and the compiled production and delivery schedule under Section SDC.8.1, the DWTSO shall for each Day generate hourly dispatch instructions for the following Dispatch Day for each Seawater Desalination Unit connected to the DWTS.

SDC.9.1.2 Each Dispatch Day covers 24 hours and is immediately followed by the successive Schedule Day starting at 6:00 am each Day.

SDC.9.1.3 To limit the transmitted data volume, an incremental database is implemented, i.e. operational data must be submitted only if it deviates from the previously submitted data.

SDC.9.2 Dispatch Instructions

SDC.9.2.1 The DWTSO will issue the Dispatch Instructions electronically for each Seawater Desalination Unit to each DWP by 9:00 am each Day for the following Dispatch Day.

SDC.9.2.2 The Dispatch Instructions comprise the following:

(a) the hourly requested production volume of each Seawater Desalination Unit of the DWP; and
(b) start time, end time and production capacity for the distinct production period.

SDC.9.2.3 Receipt of the Dispatch Instructions must be formally acknowledged immediately by each receiving DWP, indicating acceptance or non-acceptance of the Dispatch Instructions. In the case of non-acceptance, each relevant DWP must clearly indicate each non-accepted instruction and clearly state the reason for non-acceptance by not later than 10:00 am on the Day it receives the relevant Dispatch Instructions.

SDC.9.2.4 Dispatch Instructions may be non-accepted for the following reasons only:

(a) to prevent harm to personnel or Facility;
(b) to mitigate an environmental impact; or
(c) if the instruction requires operation outside of a declared Operation Characteristic and the instruction is not issued under the conditions of a System Emergency: or
(d) in the case of electrical power supply or fuel supply restrictions not caused by the DWP.

SDC.9.2.5 Where the Dispatch Instructions are deemed incomplete by the receiving User, that User shall actively seek clarification from the DWTSO.

SDC.9.2.6 Each DWP which operates a combined power and desalination plant is required to forward its Dispatch Instructions to the dispatcher of the electrical grid for information by not later than 10:00 am each Day.

SDC.9.3 Unforeseen Events

SDC.9.3.1 If a DWP experiences unforeseen difficulties in carrying out a Dispatch Instruction or an unforeseen situation occurs or is likely to occur that qualifies as a reason for rejection of the Dispatch Instructions under Section SDC.9.2.4, that DWP shall inform the DWTSO without delay.

SDC.9.3.2 If any changes of the Operational Characteristics occur after the submission of the Availability Declaration the DWP shall inform the DWTSO of such changes without delay, stating the reason for the change.

SDC.9.3.3 If each WDSO experiences unforeseen difficulties in taking the volume of Transmitted Water as stated in its Demand Notice or an unforeseen situation occurs or is likely to occur that impacts the take off of Transmitted Water from the DWTS, it shall inform the DWTSO without delay.

SDC.9.3.4 If the DWTSO experiences unforeseen interruption of electricity supply to the DWTS which affects the delivery of Transmitted Water to the WDSO, the DWTSO shall notify the relevant WDSO without delay.

SDC.9.3.5 In case of any unforeseen interruption of electricity supply to the DWTS that affects the operation of the DWTS and as a result, risks the delivery of Desalinated Water into the DWTS, the DWTSO may issue revised Dispatch Instructions to the relevant DWP during the current Dispatch Day.

SDC.9.3.6 To meet emergency and other unforeseen circumstances, the DWTSO may issue revised Dispatch Instructions to each DWP before or during the current Dispatch Day, stating the reasons for the change.

SDC.9.3.7 Each DWP shall carry out such Dispatch Instructions in order to safeguard the installations of the DWTS from any possible damages and to ensure supply to each WDS to the extent possible.
SDC-APPENDIX 1  OPERATING CHARACTERISTICS

SDC-App.1.1  General Definitions

SDC-App.1.1.1  Normal Ambient Conditions are defined for the purpose of this SWDC as follows:

(a) seawater temperature: between 15°C and 35°C
(b) seawater salinity: between 40 g/l and 45 g/l

SDC-App.1.2  Capacities

SDC-App.1.2.1  Net Rated Water Output (General)
The achievable maximum continuous net water output and capacity (m³/h) of the Seawater Desalination Unit at Normal Ambient Conditions.

SDC-App.1.2.2  Minimum Net Water Output
The minimum continuous net water output and capacity (m³/h) which the Seawater Desalination Unit can safely maintain at Normal Ambient Conditions for a declared time period.

SDC-App.1.2.3  Maximum Net Water Output
The maximum continuous net water output and capacity (m³/h) which the Seawater Desalination Unit can safely maintain at Normal Ambient Conditions for a declared time period.

SDC-App.1.2.4  Capacities at different ambient conditions
The Net Rated Water Output, Minimum Net Water Output and Maximum Net Water Output at outside the Normal Ambient Conditions.

SDC-App.1.2.5  Capacity Change Rates
Time required to increase or decrease capacity in m³/h per minute, separately for increasing capacity and decreasing capacity and for separate load ranges as applicable.

SDC-App.1.3  Time constants

SDC-App.1.3.1  Definition of Seawater Desalination Unit condition in hours after shut-down for:

(a) cold condition (thermal process) or depressurized condition (membrane process);
(b) warm condition (thermal process); and
(c) hot condition (thermal process) or pressurized condition (membrane process).

SDC-App.1.3.2  Start-up times in minutes from

(a) cold condition (thermal process) or depressurized condition (membrane process);
(b) warm condition (thermal process); and
(c) hot condition (thermal process) or pressurized condition (membrane process).
## Glossary and Definitions

In this SWDC, the following words and expressions shall, unless the subject matter or context otherwise require or is inconsistent therewith, bear the following meanings. The Abbreviations used in this SWDC are listed in GD-Appendix I to this Glossary and Definitions Section.

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adverse Environmental Incident</td>
<td>An unplanned incident, or a combination of unplanned incidents, that results in the release of substances into the environment which may: a) negatively affect the physical, chemical or biological quality of any eco-system or natural resource; and b) has a negative impact on public health and welfare.</td>
</tr>
<tr>
<td>APHA</td>
<td>The American Public Health Association</td>
</tr>
<tr>
<td>AWWA</td>
<td>The American Water Works Association</td>
</tr>
<tr>
<td>Applicant User</td>
<td>A User seeking to connect its Facility to the DWTS in accordance with the Connection Code.</td>
</tr>
<tr>
<td>Application Acceptance Date</td>
<td>The date specified in Sections CC.5.2.7 or Section CC.5.7.2, as the case may be.</td>
</tr>
<tr>
<td>Application Form</td>
<td>An application form to be prepared by the DWTSO and completed and submitted by each Applicant User in accordance with Section CC.5.2.</td>
</tr>
<tr>
<td>Availability</td>
<td>The state and level of which a Seawater Desalination Unit, together with the relevant parts of its associated auxiliary system within the relevant Seawater Desalination Plant, is capable of providing water production.</td>
</tr>
<tr>
<td>Availability Declaration</td>
<td>A notice declaring the Availability of a Seawater Desalination Unit, as described in Sections SDC.6.1 to SDC.6.11.</td>
</tr>
<tr>
<td>ASME</td>
<td>The American Society Mechanical Engineers Standards.</td>
</tr>
<tr>
<td>Business Day</td>
<td>Any day on which banks are open for business in the Kingdom of Saudi Arabia.</td>
</tr>
<tr>
<td>Charter</td>
<td>Has the meaning provided in the Implementing Regulations.</td>
</tr>
<tr>
<td>Cogeneration</td>
<td>Has the meaning provided in the Implementing Regulations.</td>
</tr>
</tbody>
</table>
Committed Water Planning Data
A set of water planning data as specified in CC-App.1.2.

Competent Authority
The Government, or any ministry, department or political subdivision thereof, any court or tribunal or any other governmental entity, instrumentality, agency, authority, committee or commission, under direct or indirect control of the Government.

Connected Water Data
A set of water planning data as specified in CC-App.1.3.

Connection Activities
The connection activities required to be performed by each Applicant User in connecting its Facility to the DWTS, as described in Section CC.6.

Connection Agreement
A connection agreement between the DWTSo and each User, for the purpose of the connection of each User’s Facilities to the DWTS, as described in Section CC.5.8.

Connection Certificate
A certificate to be issued by the DWTSo as described in Section CC.5.10.

Connection Code
The provisions set out in Sections CC.1 to CC.9.5 including CC-Appendix 1 CC-Appendix 6.

Connection Point
The physical interface between the DWTS and each User’s Facility, as described Section CC.4.

Connection Point Equipment
The equipment used to connect a Facility to the DWTS, and which an Applicant User shall design, procure, install and commission. This equipment comprises:

   a) the connecting pipeline
   b) the Water Metering System to be transferred to the DWTSo;
   c) the sampling point to be transferred to the DWTSo;
   d) the Online Monitoring System;
   e) the User’s Water Metering System;
   f) the User’s shut-off valve;
   g) pressure indicators and sensors;
and all other components and equipment required for a complete connection of a Facility to the DWTS.

Dangerous
An unplanned incident or a combination of
Occurrence

unplanned incidents that results in:

a) fire or explosion and may include an accidental explosion of gas, dust or explosive material, a fire in a confined space including underground, or a serious fire requiring the attention of a trained fire fighting team;

b) an event involving a high probability of electric shock and includes, but is not limited to an electrical short circuit or earth fault, applying earthing on live equipment, or contact with an uninsulated overhead electric line; or

c) any uncontrolled escape of high pressure gas, oil, steam or water.

Day

The 24-hour period beginning at 00:00 and ending at 00:00 midnight in the Kingdom of Saudi Arabia.

Demand Notice

A notice in relation to each WDSO’s demand requirements for Desalinated Water, as described in Sections SDC.7.1 to SDC.7.7.

Derogation

A permission granted by ECRA to a User in relation to non-compliance or non-conformity, as the case may be, with any provision of the SWDC, as set out in Section GC.14.

Desalinated Water

Transmitted Water produced by a Seawater Desalination Plant through the seawater desalination process.

Desalinated Water Producer (DWP)

A Person registered with and licensed by ECRA as being the owner or, as the case may be, the operator of a Seawater Desalination Plant.

Desalinated Water Transmission System (DWTS)

The System of pipes owned by the DWTSO and comprising pipes, pumps, plant and meters used for conveying Desalinated Water, Transmitted Water and/or Water from a Water Desalination Plant or a NSP to a Water Distribution System, and any other pipes, pumps, plant and/or meters which ECRA may specify as forming part of the Desalinated Water Transmission System.

Desalinated Water Transmission System Operator (DWTSO)

The operator of the DWTS.

Dispatch Day

The 24 hour period starting at 06:00 am on each
Day for which the Dispatch Process is applied.

Dispatch Instruction The dispatch instructions issued by the DWTSO to each DWP, defining the time specific production and delivery of Desalinated Water as described in Sections SDC.9.2.1 to SDC.9.2.6.

Dispatch Process The dispatch process during which the DWTSO optimizes the matching each:

a) Demand Notice provided by each WDSO; and

b) Availability Declarations submitted by each DWPs.

ECRA The Electricity & Cogeneration Regulatory Authority.

Electricity Law The Electricity Law of 22 November 2005 of the Kingdom of Saudi Arabia

Facility Each User’s equipment up to and including the Connection Point.

Fatality An unplanned incident or a combination of unplanned incidents that results in a single or multiple death(s) to employees of the DWTSO, each User, a contractor or a member of the public.

General Conditions The general conditions set out in Sections GC.1 to GC.16.5

Glossary and Definitions The definitions set out in this Section of the SWDC.

Good Industry Practice The exercise of that degree of skill, diligence, prudence and foresight which would reasonably and ordinarily be expected from a skilled and experienced operator engaged in the same type of undertaking under the same or similar circumstances.

Government The government of the Kingdom of Saudi Arabia.

Health and Safety Incident Either one individual or a combination of the following occurrences:

a) a Fatality;
b) a Major Injury;
c) an Ill Health Incident; or
d) a Dangerous Occurrence.

IEC
The International Electrotechnical Commission

IEEE
The Institute of Electrical and Electronics Engineers

Ill Health Incident
An unplanned incident, or a combination of unplanned incidents, that causes an accidental release or escape of any substance in a quantity sufficient to cause death, hospitalisation or ill-health of any person.

Implementing Regulations
The Electricity Law’s Implementing Regulations Related to the Duties of the Authority, in relation to the Kingdom of Saudi Arabia.

Incident
Has the meaning provided in Section OC3.4.1. Please refer also to GD-Appendix 2.

Introduction
The introductory Sections 1. to Error! Reference source not found. at the beginning of this SWDC.

Instation
Computer based systems located within the premises of the DWTSO, that collect or receive and store Water Meter Data from Outstations.

Interface Point
Has the meaning provided in Section CC.4.2.

ISO
The International Organization for Standardization

Load Dispatch Centre (LDC)
The load dispatch centre used by the DWTSO to schedule and dispatch each Seawater Desalination Unit connected to the DWTS, which may be undertaken from one or more locations.

Licence
A licence granted by ECRA in relation to the Seawater Desalination Industry.

Major Injury
An unplanned incident or combination of unplanned incidents, that results in an employee of the DWTSO, a User, a contractor or a member of the public being admitted to hospital.

Maximum Net Water
The maximum net water production capacity of a Facility as defined in Section SDC-App.1.2.3.
### Output

**Minimum Net Water Output**

The minimum net water production capacity of a **Facility** as defined in *Section SDC-App.1.2.2*.

**MOWE**

The Ministry of Water and Electricity of the Kingdom of Saudi Arabia.

**NEMA**

The National Electrical Manufacturers Association.

**Net Rated Water Output**

The net design water production capacity of a **Facility** as defined in *Section SDC-App.1.2.1*.

**Non-Seawater Plant (NSP)**

A plant connected to the **DWTS** that processes water (brackish water, ground water or surface water), other than seawater, into **Water**.

**Non Seawater Plant Operator (NSPO)**

A Person being the owner or the operator of a **NSP**.

**Normal Ambient Conditions**

Has the meaning set out in *Section SDC-App.1.1.1*.

**NWC**

The National Water Company.

**Offer of Connection**

The offer prepared by the **DWTsO** for the connection of a **Facility** to the **DWTS**, as described in *Section CC.5.6*.

**OIML**

Organisation Internationale de Métrologie Légale

**One (1) Year Operating Plan (OYOP)**

Each one (1) – year operating plan in respect of the period:

- (a) beginning 1 January; and
- (b) ending 31 December,

in the year immediately following the year in which the planning data to which that year relates is provided.

**Online Monitoring System**

Sensors and equipment installed in a water pipeline and connected to the **SCADA** system capable of measuring and calculating water quality parameter as listed in *Section CC.4.6*.

**Operating Characteristics**

Design characteristics and technical limits applicable to each **Seawater Desalination Plant** and its **Units** as described in *SDC-Appendix 1*. 
Operating Code
The provisions set out in Sections OC1 to OC6

Operation and Maintenance Manual
A manual that provides advice, instructions, guidelines and routines for the safe operation and maintenance of each Facility or the DWTS, as the case may be.

Operation Incident
Either one individual or a combination of the following occurrences:
   a) Water Contamination;
   b) an unplanned incident or combination of unplanned incidents, which results in a major component of the DWTS such as the pumping station comprising one or more groups of pumps, the trunk-main or the storage tank, failing to deliver 25% or more of its rated capacity for a period of more than 6 hours; or
   c) an unplanned incident or combination of unplanned incidents which results in a Seawater Desalination Plant or a NSP, as the case may be, failing to deliver 25% or more of its rated capacity for a period of more than 6 hours.

Operational and Safety Co-ordination Procedures
Any operational and safety co-ordination procedure that relates to the activities listed in Section OC2.4.1.2.

Operational Diagram
A diagram that is a schematic representation of a part of a Facility and the DWTS at the relevant Connection Point, incorporating numbering and nomenclature.

Operational Effect
Has the meaning provided in Section Error! Reference source not found..

Operational Plan
Either the TYOP or OYOP as the case may be, further described in Sections OC1.4 and OC1.5.

Outstation
On-site equipment which receive data from local equipment and may perform some processing of data prior to transmitting the data to an Instation or SCADA system or downloading to a local interrogation unit on request. When used with the Water Metering System, the Outstation will store data from a Water Meter and may perform some processing of data. These functions may be facilitated in one or more separate units or may be integrated with the Water Meter.
<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Person</strong></td>
<td>Any natural or corporate person.</td>
</tr>
</tbody>
</table>
| **Planned Outage**            | Any outage which is the result of maintenance planned well in advance in accordance with the process in *Section Operation Code 1*, in relation to the:  
  a) Seawater Desalination Plant;  
  b) Seawater Desalination Unit;  
  c) the DWTS;  
  d) the WDS; or  
  e) NSP.                                                                |
| **Planning Code**             | The provisions set out in *Sections 0 to 0* including *PC-Appendix 1*.                                                                    |
| **Plant Connected Consumer (PCC)** | Each *Desalinated Water* consumer which has equipment connected to any *Seawater Desalination Plant*.  
  The supply of water to each PCC is not controlled by the DWTSO.              |
| **Preliminary Water Planning Data** | A set of preliminary water planning data, as specified in *CC-Appendix 1*.                                                           |
| **Readiness to Connect Statement** | A statement to be prepared by the *Applicant User* upon completion of the *Connection Activities*, as described in detail in *Section CC.5.9*.         |
| **Reserve Desalination Capacity** | The capacity in respect of an *Operational Plan* required to compensate the *Unplanned Outage* of the *Seawater Desalination Plant* taking into account the storage capacity. |
| **Review Panel**              | The review panel established under *Section GC.11*.                                                                                        |
| **Review Panel Member**       | A member of the *Review Panel* as described in *Section GC.11.3*.                                                                       |
| **Safety Co-ordinator**       | A person being nominated by each *User* and by the DWTSO to be responsible for the co-ordination of safety precautions at each *Connection Point* when work (including testing) is to be carried out on the DWTS or the connected *Facility*. |
| **Sample Point**              | Equipment installed in a water pipeline in accordance with the requirements set out in the                                                 |
**Connection Code** for the purpose of taking water samples.

**SASO**

The Saudi Arabian Standards Organization standards.

**SCADA**

Supervisory Control and Data Acquisition.

**Schedule Day**

The 24 hour period immediately following any **Dispatch Day**, that is, commencing at 06:00 am on the expiry of the period of the Dispatch Day.

**Scheduling and Dispatch Code**

The provisions set out in *Sections SDC.1 to SDC.9.3.7* including *SDC-Appendix 1*.

**Seawater Desalination Industry**

The part of the water sector of the Kingdom of Saudi Arabia responsible for the production of desalinated seawater and its transmission to distributors and consumers, encompassing each **Desalinated Water Plant** and the **DWTS**.

**Seawater Desalination Plant**

a) A seawater desalination plant that processes seawater into **Desalinated Water**; or

b) the desalination plant as part of a **Cogeneration** plant that processes seawater into **Desalinated Water**.

**Seawater Desalination Unit**

A thermal distiller or reverse osmosis system as part of a **Seawater Desalination Plant** including associated auxiliary systems, which can be operated independently from other Seawater Desalination Units within that plant, and which is capable of producing **Desalinated Water**.

**Significant Incident**

An **Incident** which, in the DWTSO’s reasonable opinion, is a **Water Contamination**, a **Water Production Incident**, a **Water Transmission Incident** or a combination of these.

**Significant Incident Report**

A report describing a **Significant Incident** as stated in *Section OC3.5*.

**Standard Methods for Examination of Water and Wastewater**

The standard prepared and published jointly by **APHA**, **AWWA** and **WEF**.
SWDC

This Seawater Desalination Code in relation to the Kingdom of Saudi Arabia.

System Emergency

A situation where the integrity, safety or stability of all or part of the DWTS or such connected Facilities is threatened.

System Studies

The studies performed by the DWTSO to calculate the hydraulics, capacity, performance and stability of the DWTS and to verify data submitted by each User to the DWTSO as described in Sections 0, 0 and CC.5.4.

Ten Year Statement

A statement providing a ten years forecast of the development of the Seawater Desalination Industry.

Three (3)Year Operating Plan (TYOP)

The three (3) – year operating plan that covers any period:

(a) beginning in the year commencing 1 January in the year following the year in which the planning data to which that year relates is provided; and

(b) ending 31 December in the third year following the year in which the planning data to which that year relates is provided.

Total Forecast

Consolidated forecast statement as described in Section 0.

Transmission Code

Has the meaning provided in the Implementing Regulations.

Transmission System Disruption (TSD)

A disruption of the operation of the DWTS, or parts thereof, which results in the DWTS failing to transmit and supply Transmitted Water to the WDS within 50% or more of its daily planned transmission capacity during any period of not less than 24 hours. Such transmission system disruption might be caused by:

a) physical damage to the DWTS or a Facility; or

b) the occurrence of contaminated water in the DWTS, a Seawater Desalination Plant or a NSP.

Transmitted Water

Water that meets the Transmitted Water Quality.

Transmitted Water Quality

The quality of potable water defined by reference to the acceptable standards relating to microbiological quality, chemical composition, corrosive effects, physical characteristics and...
| **Transmitted Water Quality Failure** | The occurrence of water not meeting the Transmitted Water Quality. |
| **Unplanned Outage** | Any outage that is not a Planned Outage. |
| **User** | In respect of each section of the SWDC, those Users identified in the scope of each section of the SWDC, which may include:  
  a) DWPs;  
  b) NSPOs; or  
  c) WDSO. |
<p>| <strong>US EPA</strong> | The United States of America Environmental Protection Agency standards. |
| <strong>Water</strong> | The water produced and delivered by a NSP into the DWTS which meets the Transmitted Water Quality. |
| <strong>Water Contamination</strong> | A Water Quality Failure which, by reason of its effect or likely effect, gives rise, or is likely to give rise to a significant risk to the health of consumers. |
| <strong>Water Distribution System (WDS)</strong> | The system of pipes owned by a Person operating a Water Distribution System, including MOWE and NWC, and comprising pipes, pumps, plant and/or meters, used for conveying Desalinated Water, Transmitted Water and/or Water from the Desalinated Water Transmission System to customers or to another Water Distribution System, and any other pipes, pumps, plant and/or meters which ECRA may specify as forming part of a Water Distribution System. |
| <strong>Water Distribution System Operator (WDSO)</strong> | Each operator of a WDS. |
| <strong>WEF</strong> | The Water Environment Federation. |</p>
<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Water Meter</strong></td>
<td>A device for continuously measuring and recording water volume flow and water quantities.</td>
</tr>
<tr>
<td><strong>Water Meter Data:</strong></td>
<td>Water meter data produced as a result of the operation and reading of any <strong>Water Metering System</strong>.</td>
</tr>
<tr>
<td><strong>Water Metering</strong></td>
<td>The provisions set out in <em>Sections WM.1 to WM.15.2</em>.</td>
</tr>
<tr>
<td><strong>Water Metering System</strong></td>
<td>The group of control and instrumentation equipment, including Water Meters, data storage and data communication equipment, installed and operated to cover all water metering issues related to a <strong>Connection Point</strong>.</td>
</tr>
<tr>
<td><strong>Water Metering System Owner</strong></td>
<td>The DWTSO or User, as the case may be, owning the relevant <strong>Water Metering System</strong> as part of their <strong>Facility</strong> or the DWTS and responsible for operation and maintenance of such <strong>Water Metering System</strong>.</td>
</tr>
<tr>
<td><strong>Water Producer</strong></td>
<td>Either a DWP or a <strong>Non Seawater Plant Operator</strong>, as the case may be.</td>
</tr>
<tr>
<td><strong>Water Production Incident</strong></td>
<td>An unplanned incident or combination of unplanned incidents which results in a <strong>Seawater Desalination Plant</strong> or a NSP, as the case may be, failing to deliver within any period of not less than 24 hours from the occurrence of the event, the lesser of a)50% or more of its daily planned production capacity; or b)more than 100,000 cubic meter of its daily planned production capacity.</td>
</tr>
<tr>
<td><strong>Water Quality Failure</strong></td>
<td>The occurrence of water within the <strong>Seawater Desalination Plants</strong> or the DWTS not meeting the <strong>Transmitted Water Quality</strong>.</td>
</tr>
<tr>
<td><strong>Water Transmission Incident</strong></td>
<td>An unplanned incident or combination of unplanned incidents which results in the DWTS failing to transmit within any period of not less than 24 hours from the occurrence of the event, 50% or more of its daily planned transmission</td>
</tr>
<tr>
<td><strong>Year</strong></td>
<td>A Gregorian calendar year commencing 1 January and ending on 31 December.</td>
</tr>
</tbody>
</table>
**GD-APPENDIX 1 LIST OF ABBREVIATION**

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Full Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>APHA</td>
<td>American Public Health Association</td>
</tr>
<tr>
<td>AWWA</td>
<td>American Water Works Association</td>
</tr>
<tr>
<td>DWP</td>
<td>Desalinated Water Producer</td>
</tr>
<tr>
<td>DWTS</td>
<td>Desalinated Water Transmission System</td>
</tr>
<tr>
<td>DWTSO</td>
<td>Desalinated Water Transmission System Operator</td>
</tr>
<tr>
<td>ECRA</td>
<td>The Electricity &amp; Cogeneration Regulatory Authority</td>
</tr>
<tr>
<td>IEC</td>
<td>The International Electrotechnical Commission</td>
</tr>
<tr>
<td>IEEE</td>
<td>The Institute of Electrical and Electronics Engineers</td>
</tr>
<tr>
<td>ISO</td>
<td>The International Organization for Standardization</td>
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<tr>
<td>LDC</td>
<td>Load Dispatch Centre</td>
</tr>
<tr>
<td>MOWE</td>
<td>The Ministry of Water and Electricity of the Kingdom of Saudi Arabia.</td>
</tr>
<tr>
<td>NEMA</td>
<td>The National Electrical Manufacturers Association</td>
</tr>
<tr>
<td>NSP</td>
<td>Non-Seawater Plant</td>
</tr>
<tr>
<td>NSPO</td>
<td>Non Seawater Plant Operator</td>
</tr>
<tr>
<td>NWC</td>
<td>The National Water Company</td>
</tr>
<tr>
<td>OYOP</td>
<td>One (1) Year Operating Plan</td>
</tr>
<tr>
<td>PCC</td>
<td>Plant Connected Consumer</td>
</tr>
<tr>
<td>SASO</td>
<td>Saudi Arabian Standards Organization</td>
</tr>
<tr>
<td>SCADA</td>
<td>Supervisory Control and Data Acquisition.</td>
</tr>
<tr>
<td>SWDC</td>
<td>Seawater Desalination Code</td>
</tr>
<tr>
<td>TSD</td>
<td>Transmission System Disruption</td>
</tr>
<tr>
<td>Acronym</td>
<td>Description</td>
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<tr>
<td>---------</td>
<td>-------------</td>
</tr>
<tr>
<td>TYOP</td>
<td>Three (3)Year Operating Plan</td>
</tr>
<tr>
<td>US EPA</td>
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<td>WDS</td>
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<td>WEF</td>
<td>The Water Environment Federation</td>
</tr>
</tbody>
</table>
GD-APPENDIX 2 OVERVIEW INCIDENT CRITERIA

Incident (OC3.4.1)
- Adverse Environmental Incident
- Health and Safety Incident
- Operation Incident
  - Facility: loss > 25% / 6 hours
  - DTWS: loss > 25% / 6 hours

Significant Incident (OC3.5.1)
- Water Contamination Incident
- Water Production Incident
  - where loss is >50% for 24 hours
- Water Transmission Incident
  - where loss is >50% for 24 hours
- Transmission System Disruption (OC5.1)