IALA GUIDELINE

G1085
STANDARD FORMAT FOR ELECTRONIC EXCHANGE OF AtoN PRODUCT INFORMATION

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10, rue des Gaudines – 78100 Saint Germain en Laye, France
Tél. +33 (0)1 34 51 70 01 – contact@iala-aism.org

www.iala-aism.org

International Association of Marine Aids to Navigation and Lighthouse Authorities
Association Internationale de Signalisation Maritime

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1. INTRODUCTION

In the past, electronic Marine Aids to Navigation (AtoN) equipment was supplied by manufacturers with accompanying printed instruction manuals where typical functional parameters were stated. In most cases, the level and type of information provided varied between manufacturers. At the present time, this information is now supplied by many, if not all, manufacturers in electronic format, e.g., portable document format (PDF). While this allows transferring of the key equipment information into other computer software applications by manual copy-and-paste operation, both the presentation and level of detail remain diverse between different manufacturers of functionally similar equipment.

AtoN authorities are making wide use of various database centric online asset management systems for managing AtoN equipment. Once the information on a particular product is entered into the database, the information can be accessed by all relevant stakeholders within an organisation. However, the 'bottleneck' is still the time consuming and error prone data entry process, requiring careful and tedious processing of manufacturer supplied documentation.

If AtoN equipment information was provided by manufacturers electronically in an agreed format, it would be able to be loaded easily into the AtoN authority's systems, saving time and eliminating data entry errors.

Both the AtoN authorities and AtoN equipment manufacturers will benefit from establishing a common specification for the electronic exchange of such information - a Standard Format for Electronic Exchange of AtoN Product Information (SFEEAPI).

Considering the widely varying complexity of information processing systems available to different AtoN authorities and equipment manufacturers, it is reasonable to define such a standard as voluntary and open. The standard allows for both manual, and automated creation and utilisation of the product information exchanged in SFEEAPI compliant data files known as AtoN Product Information Files (PIF).

The Extensible Markup Language (XML [2]), a subset of the Standard Generalized Markup Language ([1]) has been identified as the best suitable carrier for this application. It provides a simple tagged information exchange format, resulting in small files with clear text and no embedded harmful content. A PIF is not a replacement for regular operating and maintenance manuals provided with an AtoN product; it is a list of detailed product parameters that can be utilised in automated information processing systems. A PIF can point to a user manual, facilitating automated uploading of such and other relevant electronic documents into the users' information system.

Simple rules and formats for information exchange established by SFEEAPI create preconditions for future interoperability between information systems of AtoN equipment suppliers and users. This will benefit both the users and manufacturers, allowing them to maintain high quality product configuration and performance history throughout its usable lifetime.

With the advent of information systems enabling automated AtoN system quality assurance procedures like evaluation of technical suitability of products, failure and availability statistics, automated AtoN site power consumption budget analysis etc., the need for creating a single set of industry wide formatting rules for electronic product documentation is evident. Once such a format is established, development of information systems at the organisations of both the users and the manufacturers can proceed with guaranteed global interoperability.

The SFEEAPI carries no information that would be entered directly into the list of lights of the receiving AtoN authority, therefore it does not need to conform to more complicated formatting requirements that are outlined in IALA Guideline *G1072 AtoN Information Exchange & Presentation* or the IHO *S-100 IHO Universal Hydrographic Data Model* that are intended for providing digital hydrographic-related and geospatial data. Nevertheless, once the product information transfer into an operational database of AtoN equipment is accomplished, such data may be utilised for the provision of e-Navigation services as far as applicable.

2. PURPOSE

This Guideline describes an electronic data format intended for the preparation of a standardised data file containing comprehensive AtoN product information and a method for using such files, primarily for passing AtoN product information from equipment suppliers (manufacturers) to equipment users (AtoN authorities) for loading into their information systems in a semi-automated process.

The Guideline is intended for AtoN equipment manufacturers and users. Implementation of the Guideline by equipment manufacturers is voluntary. The level of compliance with the standard will depend on the specifics of particular products.

Implementation of the Guideline by both the AtoN equipment manufacturers and AtoN authorities will guarantee interoperability of corresponding information systems at exchanging AtoN product information.

3. SCOPE

The scope of this Guideline covers AtoN signal light products and complete electronic light systems that can be described with a single set of technical parameters within a single document. An AtoN Product Information File (PIF) utilising content formatting with XML tags is intended either for a single product or system with a unique serial number or a batch of similar AtoN products.

This Guideline is the first iteration of transition of AtoN product information exchange into the digital domain, allowing the testing and refinement the concept among the stakeholder community. It does not consider other AtoN products in detail, such as buoys, Racons and AIS AtoN at this stage, however these products could be transferred with a limited data set contained in the 'Product' section of the PIF.

The Guideline builds extensively on the IALA product templates: it brings to a digital form, product parameters that exhibit the highest potential for direct use in calculations and performance checking. Additional data items were introduced in order to facilitate unambiguous interpretation of product performance in various modes of operation foreseen by the manufacturer.

The structure of a PIF is open for addition of new equipment categories (product classes) and parametric sections, thus the scope is expected to be extended in the future. A PIF can convey not only the values of numerous technical parameters of an AtoN product and manufacturer related information but also several external documents by reference (protocols, manuals, maintenance procedures, etc.). A PIF is, in practice, a 'virtual business card' of an AtoN product, similar to the vCard file format standards used for personal electronic business cards.

4. GENERAL CONCEPTS

4.1. PRODUCT INFORMATION FILE (PIF)

A Product Information File (PIF) is a human-legible text file created by the manufacturer of an AtoN product that contains technical and administrative information on the product. It contains the information either on a particular product or a product family. The information is extracted from the manufacturer's information system within the extent deemed necessary by the manufacturer for the purpose of transferring the information to the purchaser.

In addition to technical information, the PIF may contain extended information on the manufacturer and its distributors. It may also contain relevant measurement results, configuration settings and changes, references to other electronic documents, such as instruction manuals, test protocols, and failure reports.

Early adopters are expected to fill in a PIF template manually, until the capability to create PIF files in a semi-automated process is implemented in manufacturer's product information systems.

While it is expected that a PIF will be supplied by an equipment manufacturer to the purchaser as an electronic document, it may contain proprietary information that is to be treated in confidence by the purchaser. It is the manufacturer's choice whether to make any PIF public. An XML tag ContentsClassification will detail the classification status of a particular PIF either as 'Proprietary' or 'Public'.

To enable automated processing, the contents of a PIF is formatted using strictly defined XML tags and rules in accordance with Section 5, with each PIF validated by the AtoN equipment manufacturer prior to submission to the equipment purchaser (user). Nevertheless, the extent and detail level of the information provided with any product is up to the manufacturer. The only strictly defined data item that must be specified in each PIF is the classification of the product, defined by the XML tag ProductClass. Naturally, a PIF would be useless without the product model number, key performance parameters and at least basic information on the manufacturer.

XML files contain textual information in a simple open tagged format that can be displayed as a normal document using web browsers, and processed by several commercial and open source software applications like Microsoft Word and Excel 2007 (not to mention the Notepad).

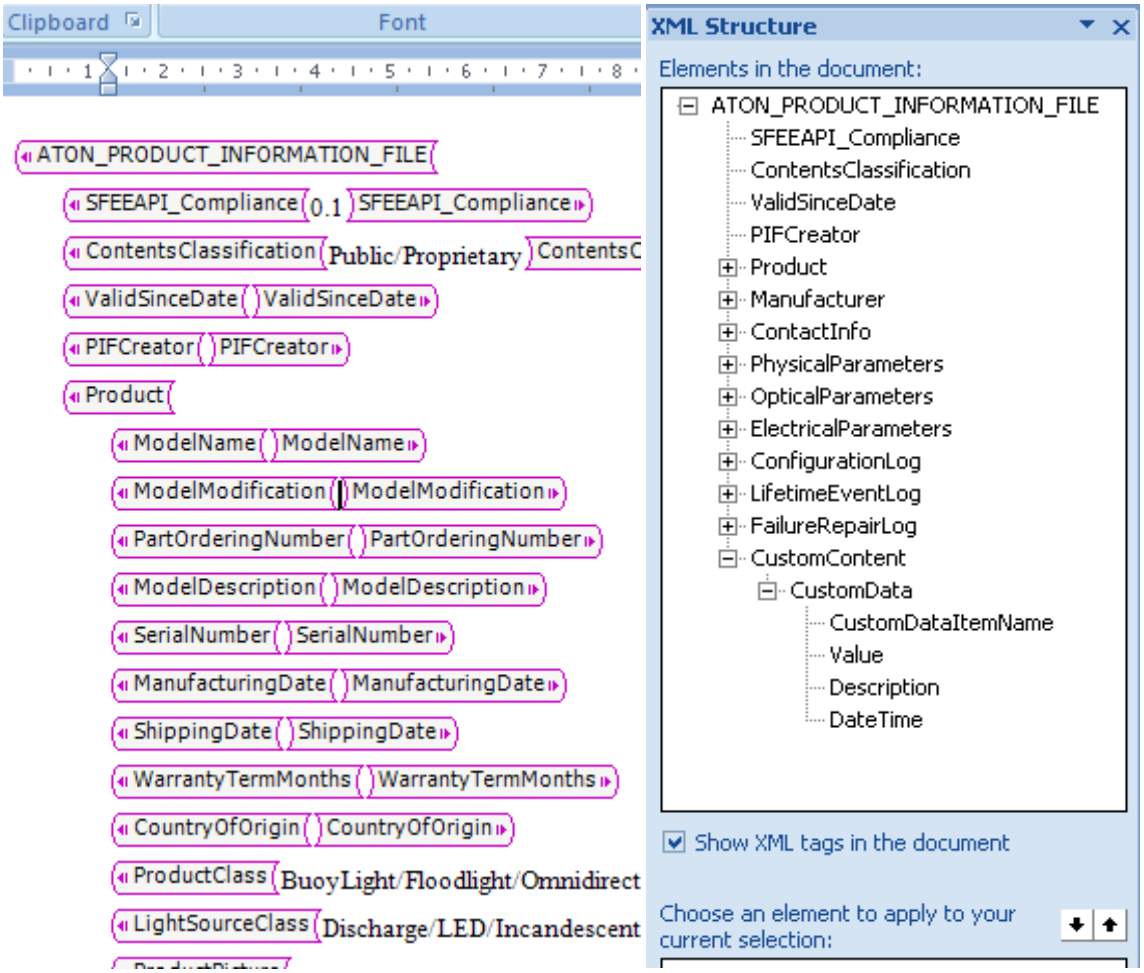

Figure 1 Fragment of a PIF template opened in MS Word 2007 for editing with the XML Structure box opened by right clicking on an XML tag and selecting 'View XML Structure'

Once created by an AtoN product manufacturer, a PIF is not intended to remain a static dataset for the lifetime of the product, although it may become a one-time product information delivery vehicle in some cases. Such a file is merely a temporary form of existence for structured product information items assembled for the process of transition from one information system to another, valid at the time of creation. Certain time-stamped sections allow for updating the PIF with new information accumulated in the course of a product's life cycle. Updating a PIF with the performance history of a product, such as measurements of luminous intensity or power consumption,

significant events, performance warnings and failures, is foreseen for a scenario where a user returns a product to a manufacturer for repair or adjustment, accompanied by an up-to-date PIF.

All data inside PIFs are expected to be provided in the English language, with real numeric values provided using only decimal notation with the period ('.') as a decimal separator. All parameter values are provided using a single set of measurement units that are shown at the end of the corresponding XML tags separated by underline to guarantee unambiguous understanding.

A comprehensive PIF template for an AtoN light system is provided at ANNEX A. While an equipment manufacturer may choose to use only some of the data fields of this template when preparing PIFs for its AtoN products, it is recommended that the full set of tags are left in the file, in order to make future updating simpler. In the future, ability to generate a PIF is expected to be built into the database centric product/asset information management systems of both the manufacturer and the user.

4.2. INDIVIDUAL ATON PIF

A manufacturer may decide to supply a dedicated PIF with a complex AtoN product or system. In this case, the file usually contains individual product settings and results of the measurements conducted on the particular product.

In addition to detailed information on the primary AtoN product, a PIF can carry administrative information and documentation on secondary AtoN products – components of an AtoN system built around the primary product. It is meaningful to join up in one PIF file the information on AtoN equipment units that would work together as a clearly defined AtoN site system with a single total power consumption figure.

It is recommended that the name of an individual AtoN PIF file be created in the following format, with components separated by '_':

C_MMMMMM_SSSSSS_PIF_YYYYMMDD.XML

The characters have the following meaning with names abbreviated by the manufacturer if needed:

C – company name of the manufacturer (maximum of 20 characters);

MMMMMM – AtoN product model name or number (maximum of 20 characters);

SSSSSS - AtoN product serial number (maximum of 20 characters);

PIF – indication of a Product Information File;

YYYYMMDD – full date of file creation/change in accordance with ISO 8601:2004 ([3]);

.XML – file name extension enabling ease of processing by XML capable software applications.

When the contents of a PIF are changed due to updating of administrative or technical information, the date in the file name shall be changed to reflect the date of last changes made.

4.3. ATON PRODUCT FAMILY PIF

In the case of simple AtoN products, it may not be feasible to prepare an individual PIF for supply with each product sold. For such product families, a single PIF can be created by the product manufacturer, containing only a general description and typical or MIN/MAX parameter values.

It is recommended to create the name of an AtoN product family PIF file in the following format with components separated by '_':

C_MMMMMM_ SSSSSS-SSSSSS_PIF_YYYYMMDD.XML

The characters have the following meaning:

C – company name of the manufacturer (maximum of 20 characters);

MMMMMM – AtoN product model name or number (maximum of 20 characters);

SSSSSS-SSSSSS – optional for supply of a batch of AtoN products: range of serial numbers separated by '-' (maximum of 41 characters); replaced by "0" if not used;

PIF – indication of a Product Information File;

YYYYMMDD – full date of file creation/change in accordance with ISO 8601:2004 ([3]);

.XML – file name extension enabling ease of processing by XML capable software applications.

If an AtoN product supplied with a family PIF requires the manufacturer's attention again, due to a failure or a need for adjustment/configuration, the user can create an individual PIF based on the existing family PIF, updating it with the subject product serial number and a time-stamped entry describing the reason for returning the product to the manufacturer.

4.4. IMPORTING OF PIF CONTENTS INTO AN ASSET MANAGEMENT SYSTEM

Once a manufacturer has created a PIF for an AtoN product sold and has transferred it to the purchaser either by e-mail, CD, flash disk or using some other suitable media, the purchaser can import the product information into the asset management systems database of the organisation. It is important to transfer all relevant files referenced inside a PIF into the same directory prior to importing into an asset management system.

The asset management software systems handling AtoN product information are expected to operate using relational databases that can link the information from PIF's with any other kind of relevant AtoN related data as necessary, allowing the product information to 'live' inside the system. Entries accumulated over time for each product may consist of measurement results, re-location and re-configuration information, observations and failure reports.

The import process is expected to proceed in semi-automated manner:

- the asset management system operator activates the feature of the information system for AtoN PIF import and points the system to the PIF;
- the system opens the PIF, scans the contents, performs validity checking of the fields, and presents the operator with key AtoN product information, requesting a confirmation to proceed with the import of product data and accompanying files; and
- upon receiving a confirmation from the operator, the system creates necessary database records for the purchased equipment, distributing the product parameters and other information in the PIF for which processing capability is built into the system in accordance with existing rules.

The owner of an asset management system database is expected to provide the necessary space for all data items of interest that are available in the PIF. The only associated cost for the user is to arrange for additional functionality to be implemented to store all PIF contents if required. If the asset management systems do not provide a facility for semi-automated PIF processing, operators can access the PIF contents using an XML capable web browser, editor or spreadsheet software and simply copy and paste the necessary information.

4.5. EXTRACTION OF UPDATED PIF CONTENTS FROM AN ASSET MANAGEMENT SYSTEM

When a purchased product requires manufacturer's attention, it can be returned to the manufacturer with the updated PIF contents extracted from the user's asset management system, provided that such advanced functionality is available.

Once a PIF is returned to the manufacturer, it can be updated again when the product has been processed and returned to the user. In such cases, it is important to avoid duplicate importing of product information into databases. The system must be capable of recognising a familiar product based on the serial number,

complementing its records only with information items that have changed (for instance; new software version, new user manual, additional test or failure analysis reports).

4.6. PIF STRUCTURE

An AtoN PIF consists of a header declaring compliance to a particular SFEEAPI version, classification of the contents and creator information, followed by the sections described below:

- The 'Product' section provides main product information: model, description, serial number, class, manufacturing date, warranty term etc.
- The 'Manufacturer' section provides manufacturer specific information: company name, location, contact information, etc. but also purchase contract and purchaser references.
- The 'ContactInfo' section provides contact information of other relevant parties: distributors, technical support, maintenance and repair organisations, etc.
- The 'OperationalParameters' section provides product life cycle related information.
- The 'PhysicalParameters' section provides static product information.
- The 'OpticalParameters' section provides light source information.
- The 'ElectricalParameters' section provides electrical information.
- The 'ConfigurationLog' section provides information on product or system settings and configuration management including data on relevant configuration items.
- The 'LifeTimeEventLog' optional section provides lifelong significant event information.
- The 'FailureRepairLog' optional section provides product failure and repairs information.
- The 'CustomContent' optional section allows providing additional information using custom-defined data items.

Each section of the PIF is described in detail in section 5.

4.7. PIF VALIDATION

In order to enable validation of the PIF content for correctness of all data items filled in by the manufacturer by automated information processing systems, a separate Document Type Definition (DTD) text file containing all data type definitions for the XML schema used in the PIF documents is provided as ANNEX B of this Guideline.

This external DTD will be associated with the PIF and must be available to the information processing systems at the time of importing a PIF. It can be used as a specification for creating the software modules for amending the existing asset management systems with PIF content importing capability. Nevertheless, filling in the PIFs manually is expected for some time after publication of this Guideline until manufacturers have automated the creation of the PIF from their systems.

4.8. USE OF PIF CONTENTS FOR MODELLING OF THE LIGHT SIGNAL

If a manufacturer has provided all the necessary information in sections OpticalParameters, ElectricalParameters and Configuration, it becomes possible to use the contents of a PIF for modelling the behaviour of the light signal generated by an AtoN product or system. With tools expected to emerge in the future, such modelling would allow users to check the visibility range of the light signal overlaid on a chart throughout the product lifetime, with variations in temperature and power supply voltage conditions.

4.9. MEASUREMENT METHODOLOGIES

Measurement values provided by the manufacturers for technical parameter fields shall be obtained using the methodologies described in relevant sections of the following documents, as far as applicable:

- Section 'OpticalParameters': IALA Recommendation R0203 (E-200-3) On Marine Signal Lights Part 3 – Measurement;
- Section 'ElectricalParameters': International Standard IEC 60945 On Maritime navigation and radiocommunication equipment and systems – General requirements – Methods of testing and required test results.

5. SFEEAPI SPECIFICATION

5.1. AtoN PRODUCT INFORMATION FILE XML ENCAPSULATION

All data items in an AtoN Product Information File (PIF) are encapsulated using a set of XML tags defined for the SFEEAPI purposes. Such tags are strictly defined and may not be changed in the process of preparation and processing of PIFs, except for incrementing the tag numbers separated by a dot and adding full groups where applicable. In general, only the data item contents surrounded by tags may be modified. Filling in certain tags is a strict requirement while most of data items are intended for voluntary utilisation. While most of the data items accept contents of characters at any reasonable volume, certain data items require strict compliance with data range, formatting, or pre-determined words for specifying equipment classes, etc.

The file starts with standard XML format specifier line:

<?xml version="1.0" encoding="UTF-8"?>

The actual data file contents are contained between the following root tags:

<ATON_PRODUCT_INFORMATION_FILE> .... </ATON_PRODUCT_INFORMATION_FILE>

The following paragraphs explain the use of PIF XML tags in detail, section by section. Blocks of tags forming a subsection are shown on light pink background.

5.2. PIF HEADER TAGS

Table 1 PIF Header tags

Tag	Type	Req?	Range	Description
SFEEAPI_Compliance	Char	Y		Identification of the SFEEAPI version to which the contents of the PIF complies.
ContentsClassification	Char	Y	strict	Determines whether the PIF is intended for publication or aimed strictly at the addressee (customer). Two classes are valid values: either Public or Proprietary.
ValidSinceDate	Char	Y		Provides a start date of validity of specifications in the PIF (YYYYMMDD).
PIFCreator	Char			Name (and version) of the software system that generated the PIF.

5.3. THE 'PRODUCT' SECTION

Table 2 'Product' section tags

Tag	Type	Req?	Range	Description
Product		Y		The section of data items presenting the administrative information on the AtoN product or system. A single Product section must exist inside any PIF.
ModelName	Char	Y		AtoN product's model name as designated by equipment manufacturer.
ModelModification	Char			AtoN product's model name extension (where applicable).
HardwareVersion	Char			Version number of the hardware.
SoftwareVersion	Char			Version number of the software.
PartOrderingNumber	Char			A manufacturer assigned number that is expected to be used at the time of ordering identical products (where applicable).
ModelDescription	Char	Y		Short description of the AtoN product.
SerialNumber	Char			Serial number of the AtoN product (required when used in case of individual PIF), or optionally an array of serial numbers separated by ';' in case of several products supplied with a single 'batch PIF'.
ManufacturingDate	Char			Date of manufacturing of the primary AtoN product (YYYYMMDD).
ShippingDate	Char			Date of shipping to the customer of the primary AtoN product (YYYYMMDD).
WarrantyTermMonths	Integer	Y		Length of the AtoN products warranty period in full months.
CountryOfOrigin	Char			Country of origin (preferential origin) of the product. If this data item is empty, the primary product described by a PIF is expected to have the preferential origin of the manufacturer's country of residence.
ProductClass	Char	Y	strict	Defines the class of the primary product for entry into asset management systems database. May be extended in the future. One of the following classes must be used: BuoyLight, IPSL, Floodlight, OmnidirectionalBeacon, RangeLight, RotatingBeacon, OmniSectorLight, ProjectorSectorLight, Other.

Tag	Type	Req?	Range	Description
LightSourceClass	Char	Y	strict	Defines the light source technology of the product for entry into asset management systems database. One of the following classes must be used: Discharge, Halogen, Incandescent, LED, Other.
ProductPicture				A block of tags encapsulating reference to product pictures accompanying the PIF or available from the web URL. Several **ProductPicture** blocks may be used in a PIF.
PictureURL	Char			Either a file name of a product picture accompanying the PIF, or a web URL.
Caption	Char			Caption for the picture file.
UserManualURL	Char			Either a file name of a user manual for the primary AtoN product accompanying the PIF, or a web URL (PDF expected).
ProductDocument				This subsection (block of tags) encapsulates reference to product related documents accompanying the PIF or available from the web URL. Several **ProductDocument** blocks may be used in a PIF.
DocClass	Char		strict	Specifies the class (type) of the document to be uploaded into the asset management system. One of the following classes must be used: Drawing, Instructions, Protocol, Specification, Template, Other.
DocName	Char			Title of the document to be uploaded.
DocURL	Char			Name of the document file accompanying the PIF, or web URL.
DocSize_kB	Integer			Size of the document.
Comment	Char			General comment on subject AtoN product or system.

5.4. THE 'MANUFACTURER' SECTION

Table 3 'Manufacturer' section tags

Tag	Type	Req?	Range	Description
Manufacturer		Y		This section provides information on the manufacturer supplying the product described in the PIF.
Name	Char	Y		Name of the manufacturer.
RegistrationNumber	Char	Y		Company registration number of the manufacturer.

Tag	Type	Req?	Range	Description
VATNumber	Char			VAT number of the manufacturer.
StreetAddress	Char			Street address of the manufacturer.
ZipCode	Char			Postal code of the manufacturer.
City	Char			City of residence of the manufacturer.
Country	Char	Y		Country of residence of the manufacturer. Unless the **CountryOfOrigin** tag is filled, this will also be considered a country of origin of the primary product.
Website	Char			Website address of the manufacturer.
Emai	Char			Email address of the manufacturer.
Phone	Char			Phone number of the manufacturer.
ContactPerson	Char			Designated contact person of the manufacturer.
Comment	Char			General comment entered by the manufacturer.
ContractReference	Char	Y		Reference to a purchase order number or a contract between the Manufacturer and purchasing organisation.
PurchaserReference	Char	Y		Reference to a purchaser or designated contact person for a relevant contract.

5.5. THE 'CONTACTINFO' SECTION

Table 4 'ContactInfo' section tags

Tag	Type	Req?	Range	Description
ContactInfo				This section can provide information on several entities (companies) related to the AtoN product described in the PIF in several functions.
Contact				This subsection encapsulates contact information of an entity (company) related to the AtoN product in a function defined in **ContactClass**; repeated for as many times as necessary (for different distributors, service providers, etc.).
ContactClass	Char		strict	Specifies the class (type) of the contact in relation to the AtoN product. One of the following classes must be used: Agent, Distributor, Maintenance, Repair, Techsupport, Other.
Name	Char			Contents of the tags are similar to the section **Manufacturer**.
RegistrationNumber	Char			

Tag	Type	Req?	Range	Description
VATNumber	Char			
StreetAddress	Char			
ZipCode	Char			
City	Char			
Country	Char			
Website	Char			
Email	Char			
Phone	Char			
ContactPerson	Char			
Comment	Char			

5.6. THE 'OPERATIONALPARAMETERS' SECTION

Table 5 'OperationalParameters' section tags

Tag	Type	Req?	Range	Description
OperationalParameters		Y		This section describes the operational parameters of the AtoN product. It can have repeated tag blocks describing maintenance.
ServiceLife_Years	Integer			Service life estimate in years.
MTBF	Integer			Mean Time Between Failures as estimated by the manufacturer, [hours].
IngressProtectionClass	Char			Ingress protection class in accordance with IEC 60529
EnvironmentTemperatureMin_degC	Integer	Y		Lowest temperature of the operating environment.
EnvironmentTemperatureMAX_degC	Integer	Y		Highest temperature of the operating environment.
VibrationTolerance_g	Real			Vibration tolerance level.
Maintenance				Time-directed maintenance related requirement blocks may be repeated as many times as required to convey a full maintenance schedule. Information on situational maintenance is not conveyed in PIF.
Task				Nested block for description of specific maintenance tasks.

Tag	Type	Req?	Range	Description
OperationalHours	Real			Provided when the task needs to be performed after certain amount of operational hours have been reached.
CalendarHours	Real			Provided when the task needs to be performed after certain amount of calendar hours have been reached.
Description	Char			Short description of the maintenance task.
InstructionsURL	Char			File name (if supplied on the same media with the PIF) or web URL of the maintenance task instructions.
DocSize_kB	Integer			Size of the document.
Comment	Char			Any clarification of operational parameters of the product.

5.7. THE 'PHYSICALPARAMETERS' SECTION

Table 6 'PhysicalParameters' section tags

Tag	Type	Req?	Range	Description
PhysicalParameters		Y		This section describes the physical parameters of the AtoN product. It has no repeated tag blocks; this information is expected to remain static for the lifetime of the product.
Height_mm	Integer			Maximum vertical dimension of the product.
Width_mm	Integer			Maximum width (horizontal dimension) of the product.
Depth_mm	Integer			Maximum depth (length) of the product.
Diameter_mm	Integer			Maximum diameter of the product (usually same as width).
MountDescription	Char			Short description of the mounting arrangement of the product.

Tag	Type	Req?	Range	Description
BodyMaterial	Char			Dominating material(s) used for making the primary AtoN products body (enclosure).
Weight_	Integer	Y		Weight of the AtoN product.
Comment	Char			Any clarification of physical parameters of the product.

5.8. THE 'OPTICALPARAMETERS' SECTION

Table 7 The 'OpticalParameters' section

Tag	Type	Req?	Range	Description
OpticalParameters		Y		This section provides detailed information on optical parameters of the AtoN product. It encapsulates sub-subsections providing typical values of light signal generation related parameters claimed by the manufacturer, and consecutive measurement values taken at different times of the AtoN products life cycle.
LensDiameter_mm	Integer			Diameter of the lens or width of the light emitting aperture of the light source.
LensHeight_mm	Integer			Height of the lens or light emitting aperture of the light source.
LensTiers	Integer			Number of tiers (vertical levels) used for generating the light signal; number of lens blocks.
FocalHeight_mm	Integer			Focal height of the AtoN light measured from the bottom surface of the product (vertical centreline of the optical apparatus of a multi-tiered product).
LensMaterial	Char			Material used for making the lenses.
TypicalOptical		Y		This subsection provides typical values for light signal generation related parameters claimed by the manufacturer. Due to the significant differences in light generating components, individual products may deviate from the typical parameters. In case when same AtoN product is used for provision of daytime and night time light signals, two **TypicalOptical** subsections should be used to describe both modes of operation, explained under Comment. The order of the **TypicalOptical** subsections must be identical to the corresponding **TypicalElectrical** subsections in the **ElectricalParameters** section.

Tag	Type	Req?	Range	Description
Sector		Y		This sub-subsection provides typical values for light signal generation related parameters for each sector of an AtoN light (a single sector in case of omnidirectional light distribution). It is repeated as many times as needed to describe all sectors.
SectorWidth_deg	Real	Y	0 360	Typical width of a particular light signal sector [º].
SectorStart_deg	Real		0 360	Beginning marker of the light signal sector [º].
SectorEnd_deg	Real		0 360	End marker of the light signal sector [º]
SectorUncertainty_deg	Real			Typical uncertainty limits of the horizontal sector specification, ± [º].
BoundaryResolution_min	Real			Full sector boundary resolution specification for the sector lights, minutes of arc ['].
TypicalIntensity_cd	Real	Y		Typical luminous intensity of the light signal in the current sector.
IntensityUncertainty_cd	Real			Typical uncertainty limits of the luminous intensity specification, ± [cd].
IntensitySpecTemperature_deg	Real			Temperature for which the luminous intensity specification is given, [ºC].
IntensityDegradation_hour	Integer			Estimation of operational hours at a given maximum ambient temperature until degradation of light output to 70% of the initial luminous intensity, [h].
DegradationTempLimit_degC	Integer			Maximum ambient temperature for which the degradation of light output to 70% of the initial luminous intensity is provided, [ºC].
SectorUniformity	Real			Uniformity specification for the current sector (horizontal), ± [%].
VerticalDivergenceFWHM_deg	Real	Y		Typical vertical divergence of the light signal at 50% level of typical intensity in the current sector, [º].
VerticalDivergenceFWTM_deg	Real			Typical vertical divergence of the light signal at 10% level of typical intensity in the current sector, [º].
VerticalDivergenceUncertainty	Real			Typical uncertainty limits of the vertical divergence angle specification, ± [º].

Tag	Type	Req?	Range	Description
SectorColour	Char	Y		Colour of the light signal emitted in the current sector.
Wavelength_nm	Real			Typical dominating wavelength of the light signal emitted in the current sector, [nm].
WavelengthUncertainty_nm	Real			Uncertainty of the wavelength specification for the current sector, [nm].
SpectrumColourCoordinates				This is a tag block specifying typical colour coordinates in CIE 1931 colour space of the light signal emitted in the current sector, and colour temperature [K] in case of white light.
ColourCoordinate_x	Real			Colour Coordinate x.
ColourCoordinate_x_Uncertainty	Real			Uncertainty of Colour Coordinate x specification, ± [ ].
ColourCoordinate_y	Real			Colour Coordinate y.
ColourCoordinate_y_Uncertainty	Real			Uncertainty of Colour Coordinate y specification, ± [ ].
ColourTemperature_K	Real			Colour temperature [K] in the sector (in case of white light).
ColourTemperatureUncertainty_K	Real			Colour temperature uncertainty, ±[ ].
SpectrumProtocolReference				This block of tags refers to a spectrum measurement protocol file(s) that a manufacturer has based its specification on.
DescriptionNR	Char			Name and number of the spectrum measurement protocol.
ProtocolURL	Char			File name (if supplied on the same media with the PIF) or web URL of the manufacturers' spectrum measurement protocol.
DocSize_kB	Integer			Size of the document.
HorIntensityDistribution_degCd	Char			An array of sequential values of angular positions in degrees [º] and luminous intensity values in [cd] that represent a typical horizontal distribution of the luminous intensity of the light source. Value separator is semicolon ';'.

Tag	Type	Req?	Range	Description
VertIntensityDistribution_degCd	Char			An array of sequential values of angular positions in degrees [º] and luminous intensity values in [cd] that represent a typical vertical distribution of the luminous intensity of the light source. Value separator is semicolon ';'.
IntensityTempCurve_degCd	Char			An array of sequential values of temperatures in degrees [ºC] and luminous intensity values in [cd] that represent a typical temperature dependence curve of the luminous intensity of the AtoN product or system. Value separator is semicolon ';'.
IntensityProtocolReference				This block of tags refers to a luminous intensity measurement protocol file(s) that a manufacturer has based its specification on.
DescriptionNR	Char			Name and number of the luminous intensity measurement protocol.
ProtocolURL	Char			File name (if supplied on the same media with the PIF) or web URL of the manufacturers luminous intensity measurement protocol.
DocSize_kB	Integer			Size of the document.
Comment	Char			Any clarification of typical optical parameters of the AtoN product.
MeasDateTime	Char			Time stamp of the latest measurements that the typical optical parameter specification is based upon: YYYYMMDDTHHMM (hours and minutes may be skipped).
LightMeasurement				This subsection provides actual measurement values of light signal generation related parameters, either provided by the manufacturer or conducted by other parties for different modes of operation, or consecutive measurements during the products lifetime. The order of the **LightMeasurement** subsections must be identical to the corresponding **PowerMeasurement** subsections in the **ElectricalParameters** section.

Tag	Type	Req?	Range	Description
Sector				This sub-subsection provides measurement values for light signal generation related parameters for each sector of an AtoN light (a single sector in case of omnidirectional light distribution). It is repeated as many times as needed to describe all sectors.
SectorWidth_deg	Real		0 360	Measured width of a particular light signal sector [º].
SectorStart_deg	Real		0 360	Measured beginning of the light signal sector [º].
SectorEnd_deg	Real		0 360	Measured end of the light signal sector [º].
SectorUncertainty_deg	Real			Uncertainty of the horizontal sector measurement, ± [º].
BoundaryResolution_min	Real			Full sector boundary resolution of a sector lights measured, minutes of arc ['].
AverageIntensity_cd	Real			Measured average luminous intensity of the light signal in the current sector, [cd].
IntensityUncertainty_cd	Real			Uncertainty of the luminous intensity measurement, ± [cd].
IntensityMeasTemperature_deg	Real			Temperature at which the luminous intensity was measured, [ºC].
SectorUniformity	Real			Determined light signal uniformity in the current sector, ± [%].
VerticalDivergenceFWHM_deg	Real			Measured vertical divergence of the light signal at 50% level of average intensity in the current sector, [º].
VerticalDivergenceFWTM_deg	Real			Measured vertical divergence of the light signal at 10% level of average intensity in the current sector, [º].
VerticalDivergenceUncertainty	Real			Uncertainty of the vertical divergence angle measurement, ± [º].
SectorColour	Char			Colour of the light signal emitted in the current sector.
Wavelength_nm	Real			Measured dominating wavelength of the light signal emitted in the current sector, [nm].
WavelengthUncertainty_nm	Real			Uncertainty of the wavelength measurement in the current sector, [nm].

Tag	Type	Req?	Range	Description
SpectrumColourCoordinates				This is a tag block specifying measured colour coordinates in CIE 1931 colour space of the light signal emitted in the current sector, and colour temperature [K] in case of white light.
ColourCoordinate_x	Real			Measured Colour Co-ordinate x.
ColourCoordinate_x_Uncertainty	Real			Uncertainty of Colour Co-ordinate x measurement, ±[ ].
ColourCoordinate_y	Real			Measured Colour Coordinate y
ColourCoordinate_y_Uncertainty	Real			Uncertainty of Colour Co-ordinate y measurement, ±[ ].
ColourTemperature_K	Real			Measured colour temperature [K] in the sector (in case of white light).
ColourTemperatureUncertainty_K	Real			Colour temperature measurement uncertainty, ±[K].
SpectrumProtocolReference				This block of tags refers to a spectrum measurement protocol file(s) that is a source of values for data items in this section.
DescriptionNR	Char			Name and number of the spectrum measurement protocol.
ProtocolURL	Char			File name (if supplied on the same media with the PIF) or web URL of the spectrum measurement protocol.
DocSize_kB	Integer			Size of the document.
HorIntensityDistribution_degCd	Char			An array of sequential measurement values of angular positions in degrees and luminous intensity values in [cd] that represent the horizontal distribution of the luminous intensity of the light source. Value separator is semicolon ';'.
VertIntensityDistribution_degCd	Char			An array of sequential measurement values of angular positions in degrees [º] and luminous intensity values in [cd] that represent the vertical distribution of the luminous intensity of the light source. Value separator is semicolon ';'.
IntensityTempCurve_degCd	Char			An array of sequential measurement values of temperatures in degrees [ºC] and luminous intensity values in [cd] that represent a typical temperature dependence curve of the luminous intensity of the AtoN product or system. Value separator is semicolon ';'.

Tag	Type	Req?	Range	Description
IntensityProtocolReference				This block of tags refers to a luminous intensity measurement protocol file(s) that is a source of values for data items in this section.
DescriptionNR	Char			Name and number of the luminous intensity measurement protocol.
ProtocolURL	Char			File name (if supplied on the same media with the PIF) or web URL of the luminous intensity measurement protocol.
DocSize_kB	Integer			Size of the document.
Comment	Char			Any clarification of measured optical parameter values.
MeasDateTime	Char			Time stamp of the latest measurements in this subsection: YYYYMMDDTHHMM (hours and minutes may be skipped).

5.9. THE 'ELECTRICALPARAMETERS' SECTION

Table 8 'ElectricalParameters' section tags

Tag	Type	Req?	Range	Description
ElectricalParameters		Y		This section provides detailed information on electrical parameters of the AtoN product. It encapsulates sub-subsections providing typical values of power consumption related parameters claimed by the manufacturer, and consecutive measurement values taken at different times of the AtoN products life cycle.
TypicalElectrical		Y		This section provides typical electrical parameters of the AtoN product or system. The order of the **Typical** subsections must be identical to the corresponding subsections in the **OpticalParameters** section.
CurrentType	Char	Y	strict	Type of the current for which the primary AtoN product is intended: AC, DC, Universal.

Tag	Type	Req?	Range	Description
PowerSupplyType	Char			Type of the power supply: Linear, step up converter, step down converter, other.
ReversePolarityProtection	Char			Description of reverse polarity protection employed in the AtoN product or system.
SurgeProtection	Char			Description of surge protection employed in the AtoN product or system.
PowerSupplyInrushCurrent_A	Real			Description of the inrush current level pulled from the power supply during cold starts; value in [A] if given.
VoltageNominal_V	Real	Y		Nominal power supply voltage of the primary AtoN product or system, [V].
VoltageMinimum_V	Real			Minimum power supply voltage of the primary AtoN product or system, [V].
VoltageMaximum_V	Real			Maximum power supply voltage of the primary AtoN product or system, [V].
LightSourceRegulation	Char			Description of the methods employed by the AtoN product or system for regulation of the light intensity: temperature or aging dependent control of LED current, etc.
FlashSynchronisation	Char			Description of the capability of the AtoN product or system to synchronize the flashing with other AtoN lights.
ExtControlOfFlashing	Char			Description of the means necessary for applying external control of flashing the light signal of the AtoN product or system.
MonitoringCapability	Char			Description of the means necessary for applying remote monitoring to the AtoN product or system.
ControlCapability	Char			Description of the capability of the AtoN product to accept remote control.
SolarCellType	Char			Type of the solar cells if used.
SolarCellPower_W	Real			Power output capability of solar cells if used, [W].

Tag	Type	Req?	Range	Description
SolarCellNumber	Integer			Provides the number of (external) solar cells used by the product/system.
BatteryType	Char			Provides the model number of batteries if used in the system (each can be described in more detail at the **ConfigurationItems** section if necessary).
BatteryCapacity	Real			Capacity of the battery (if used), [Ah].
BatteryTechnology	Char			Describes battery technology.
BatteryVoltage_V	Real			Specifies voltage of a single battery used, [V].
BatteryNumber	Integer			Provides the number of batteries used by the product/system.
FlasherType	Char			Type of a flasher if present.
LightSensorType	Char			Type of a light sensor if present.
PowerConsumption		Y		This subsection provides a specification for power consumption related parameters for an AtoN light product or system. In case when same AtoN product is used for provision of daytime and night time light signals, two subsections should be provided to describe both modes of operation.
PowerConsumptionMode	Char	Y		Short description of the mode of operation for which the below power consumption figures are provided: Night, Day, Other etc.
PowerConsumptionFlash_W	Real	Y		Typical (nominal) power consumption in flash in specified operating mode, [W].
PowerConsumptionEclipse_W	Real			Typical (nominal) power consumption in eclipse in specified operating mode, [W]
PowerConsumptionStandby_W	Real			Typical (nominal) power consumption during standby state, [W].

Tag	Type	Req?	Range	Description
PowerConsumption_VW	Real			An array of sequential measurement values of power supply voltages in [V] and corresponding power consumption in [W] that represent the consumption behaviour in flash at the temperature specified below throughout the range allowed by the manufacturer. Value separator is semicolon ';'.
PowerSpecTemperature_degC	Real			Temperature for which the power consumption specification is given, [ºC].
VoltageNomCurrentConsumption_A	Real			Typical current consumption at the nominal power supply voltage, [A].
VoltageMinCurrentConsumption_A	Real			Typical current consumption at power supply voltage minimum, [A].
VoltageMAXCurrentConsumption_A	Real			Typical current consumption at power supply voltage maximum, [A].
PowerFactorAC	Real			Power factor specification for an AtoN product operating from AC utility power.
CurrentUncertainty_A	Real			Typical limits for current consumption specification, [A].
VoltageUncertainty_V	Real			Typical limits for power supply voltage specification, [V].
ProtocolReference				This block of tags refers to a power consumption measurement protocol file(s) that a manufacturer has based its specification on.
DescriptionNR	Char			Name and number of the power consumption measurement protocol.
ProtocolURL	Char			File name (if supplied on the same media with the PIF) or web URL of the manufacturers power consumption measurement protocol.
DocSize_kB	Integer			Size of the document
Comment	Char			Clarifications of power consumption specifications.

Tag	Type	Req?	Range	Description
MeasDateTime	Char			Time stamp of the latest measurements in this subsection: YYYYMMDDTHHMM (hours and minutes may be skipped).
PowerMeasurement				This subsection provides measurement values for power consumption related parameters of an AtoN light. It is repeated as many times as needed to describe all operating modes or consecutive measurements during products life cycle. It can be linked by comment to a particular **Configuration**. The order of the **PowerMeasurement** subsections must be identical to the corresponding **LightMeasurement** subsections in the **OpticalParameters** section.
PowerConsumptionMode	Char			Short description of the mode of operation for which the below power measurements figures are provided: Night, Day, Other etc.
PowerConsumptionFlash_W	Real			Measured nominal power consumption in flash in specified operating mode, [W].
PowerConsumptionEclipse_W	Real			Measured nominal power consumption in eclipse in specified operating mode, [W].
PowerMeasTemperature_degC	Real			Temperature at which the power consumption was measured, [ºC].
VoltageNomCurrentConsumption_A	Real			Measured current consumption at the nominal power supply voltage, [A].
VoltageMinCurrentConsumption_A	Real			Measured current consumption at power supply voltage minimum, [A].
VoltageMAXCurrentConsumption_A	Real			Measured current consumption at power supply voltage maximum, [A].
PowerFactorAC	Real			Measured power factor of an AtoN product operating from AC utility power.
CurrentUncertainty_A	Real			Uncertainty of current consumption measurement, [A].

Tag	Type	Req?	Range	Description
VoltageUncertainty_V	Real			Uncertainty of power supply voltage measurement, [V].
ProtocolReference				This block of tags refers to a power consumption measurement protocol file(s) that a manufacturer has based its specification on.
DescriptionNR	Char			Name and number of the power consumption measurement protocol.
ProtocolURL	Char			File name (if supplied on the same media with the PIF) or web URL of the manufacturers' power consumption measurement protocol.
DocSize_kB	Integer			Size of the document.
Comment	Char			Clarifications of power consumption measurements.
MeasDateTime	Char			Time stamp of the latest measurements in this subsection: YYYYMMDDTHHMM (hours and minutes may be skipped).

5.10. THE 'CONFIGURATIONLOG' SECTION

Table 9 'ConfigurationLog' section tags

Tag	Type	Req?	Range	Description
ConfigurationLog				This section provides information on the configuration and settings of an AtoN product or system at the time of leaving the manufacturers factory, and after re-configurations in the course of its usable lifetime (if recorded). It allows conveying basic information on related AtoN system configuration items using a recurring tag block.

Tag	Type	Req?	Range	Description
Configuration				This subsection is a core element of the **ConfigurationLog**, offering a way to record time stamped AtoN system configuration changes. It includes a nested tag block for AtoN system configuration items. The first occurrence of this subsection corresponds to factory configuration and settings of an AtoN product or system.
Name	Char			Name of a specific configuration of an AtoN product or system. The first configuration at the time of supply to the user should be named 'Factory'. The following re-configurations in the course of products usable lifetime should be given short names not exceeding 20 characters – for instance, DateTime strings (YYYYMMDDTHHMM), if no suitable names can be found.
FirmwareVersion	Char			Firmware version number of the key configuration item of the AtoN system (where applicable).
FlashCharacter	Char			Flashing character applied to the AtoN product or system.
PWMDutyCycle	Real			Pulse Width Modulation (PWM) duty cycle applied to the AtoN product, [%].
NominalRangeNight_NM	Real			Night time nominal range of the AtoN product resulting from luminous intensity, flash character and PWM duty cycle applied.
NominalRangeDay_NM	Real			Daytime nominal range of the AtoN product resulting from luminous intensity, flash character and PWM duty cycle applied.
PowerAutonomy_hour	Integer			Provides the extent of power supply autonomy for products or systems utilising battery backup (both solar and utility power systems), [hour].

Tag	Type	Req?	Range	Description
PowerCableLength_m	Real			Length of the power cable supplied with the AtoN product or system.
PowerCableType	Char			Description of the power cable supplied with the AtoN product or system.
LightSwitchSetting	Char			Description of the setting of the AtoN products light switch.
DayNightSwitchingLevel_lx	Real			Configured ambient light threshold for day/night intensity switching, [lx].
LightSwitchingLevelON_lx	Real			Configured lower ambient light threshold for switching the AtoN light ON (night mode for 24h lights), [lx].
LightSwitchingLevelOFF_lx	Real			Configured higher ambient light threshold for switching the AtoN light OFF (day mode for 24h lights), [lx].
DayNightSwitchingDelay_s	Real			Time delay for Day/Night mode switching (also for night time only flashing), [s].
IntensityDegradation				Block of tags providing information on yearly light source intensity degradation depending on configuration settings.
Colour	Char			Affected colour of the AtoN product.
YearlyPercentage	Real			Percentage of yearly luminous intensity degradation of the light source when operated at current configuration settings at +20ºC, [%].
SourceTemperature_degC	Real			Estimated operating temperature of the light source (semiconductor junction of an LED) at current configuration settings at +20ºC (use the Comment field if different), [ºC].
ConfigurationItem				Block of tags providing information on configuration items forming and AtoN system in cooperation with the primary AtoN product.

Tag	Type	Req?	Range	Description
ConfAction	Char		strict	Configuration management related action other than maintenance or repair: Factory / Added / Removed / Other.
ModelName	Char			System configuration items model name or number.
ModelModification	Char			System configuration items model modification.
PartOrderingNumber	Char			Manufacturers (spare) part ordering number for a particular configuration item.
ModelDescription	Char			Short description of the configuration item.
SerialNumber	Char			Serial number of the configuration item.
Document				Block of tags for inclusion of relevant documents for AtoN system configuration items.
DocClass	Char		Strict	Class (type) of a particular document: Drawing / Instructions / Protocol / Specification / Template / Other.
DocName	Char			Name of a particular document.
DocURL	Char			Name of the document file accompanying the PIF, or web URL.
DocSize_kB	Integer			Size of the document.
Comment	Char			Description of a particular configuration item.
ChangeDateTime	Char			Time stamp of the latest configuration change: YYYYMMDDTHHMM.
Comment	Char			Description of a particular configuration.

5.11. THE 'LIFETIMEEVENTLOG' SECTION

Table 10 'LifetimeEventLog' section tags

Tag	Type	Req?	Range	Description
LifetimeEventLog				This section allows providing information on the significant events occurring in the life cycle of an AtoN product or system which is not directly related to failures or configuration changes. It can be used for conveying maintenance and observation reports. All events, configuration changes and measurements can be interrelated within the system by nearly identical time stamps.
Event				This recurring subsection contains tags for description of events and inclusion of related documents.
EventType	Char			Partly strict event types are introduced to define most of common events that could be recognised by any SFEEAPI compliant asset management system. Any significant event type that needs to be described using the Event section can be introduced by a user, providing relevant type and documentation: Observation / Maintenance / Relocation / EndofLife.
EventIdentNo	Char			Identification number of an event in users' information system.
EventTimeStamp	Char			Time stamp of the latest event: YYYYMMDDTHHMM.
EventInformation	Char			Detailed information on the event.
Document				A block of tags for inclusion of documents related to a specific event.
DocName	Char			Name of a particular document.
DocURL	Char			Name of the document file accompanying the PIF, or web URL.
DocSize_kB	Integer			Size of the document.

5.12. THE 'FAILUREREPAIRLOG' SECTION

Table 11 'FailureRepairLog' section tags

Tag	Type	Req?	Range	Description
FailureRepairLog				This section allows communicating information on product failures between the user and the manufacturer.
Failure				This recurring subsection contains tags for description of failure cases and repairs and inclusion of related documents.
FailureClass	Char		strict	Critical, NonCritical.
FailureIdentNo	Char			Identification number of the failure case in the user's information system.

Tag	Type	Req?	Range	Description
FailureTimeStamp	Char			Time stamp of the current failure: YYYYMMDDTHHMM.
FailureDescription	Char			Detailed information on the product failure.
RepairIdentNo	Char			Identification number of the failure case in the manufacturer's information system.
RepairInformation	Char			Detailed failure analysis information.
RestoreTimeStamp	Char			Time stamp of the products operation restored: YYYYMMDDTHHMM.
Document				A block of tags for inclusion of documents related to the current failure case.
DocName	Char			Name of a particular document.
DocURL	Char			Name of the document file accompanying the PIF or web URL.
DocSize_kB	Integer			Size of the document.
Comment	Char			Users' final comments on a particular failure case.

5.13. THE 'CUSTOMCONTENT' SECTION

Table 12 'CustomContent' section tags

Tag	Type	Req?	Range	Description
CustomContent				This section allows to define new data items for provision of information which cannot be communicated by existing XML tags.
CustomData				This recurring subsection contains tags for description of custom data items and provision of corresponding values. A reasonable amount of custom data items may be used in a PIF file.
CustomDataItemName	Char			Name of a custom data item.
Value	Char			Value of a custom data item.
Description	Char			Description and purpose of a custom data item.
DateTime	Char			Time stamp related to a custom data item: YYYYMMDDTHHMM.

6. DEFINITIONS

The definitions of terms used in this Guideline can be found in the *International Dictionary of Marine Aids to Navigation* (IALA Dictionary) at http://www.iala-aism.org/wiki/dictionary and were checked as correct at the time of going to print. Where conflict arises, the IALA Dictionary should be considered as the authoritative source of definitions used in IALA documents. Specifically for this document:

AtoN equipment Electronic products used within AtoN infrastructure to establish a Marine Aid to Navigation

DTD	Document Type Definition; a set of markup declarations that define a document type for SGML family of markup languages
PIF	Product Information File; an AtoN product data file with the content encoded in UTF-8 text using XML in accordance with the current Guideline
SFEEAPI	Standard Format for Electronic Exchange of AtoN Product Information, as defined within this Guideline

7. ABBREVIATIONS

A	ampere(s)
AC	Alternating current
Ah	ampere hour(s)
AIS	Automatic Identification System
AtoN	Aid(s) to Navigation
C	Celsius (previously Centigrade)
cd	Candela
CD	Compact Disc
Char	Character
CIE	Commission Internationale de l'Eclairage (International Commission on Illumination)
DC	Direct current
degC	degrees Celsius
DTD	Document Type Definition
g	vibration tolerance
g	grams
h	lux; extent of power supply autonomy for products or systems
IEC	International Electrotechnical Commission
IHO	International Hydrographic Office
IPSL	Independent Power Systems Lanterns
ISO	International Organization for Standards Uniform Resource
K	Colour temperature; [K] = [°C] + 273.15
kB	kilobytes
LED	Light-emitting diode
lx	lux
nm	nanometre
NM	nautical mile(s)
mm	millimetres
PDF	Portable document format
PIF	Product Information File(s)
PWM	Pulse Width Modulation
Racon	Radar beacon
SFEEAPI	Standard Format for Electronic Exchange of AtoN Product Information
SGML	Standard Generalized Markup Language (ISO 8879:1986) [2]
S-100	Geospatial Information Registry (IHO)

URL	Uniform Resource Locator
UTF-8	Universal Character Set (UCS) Transformation Format — 8-bit; (ISO/IEC 10646)
V	volt(s)
VAT	Value added tax
W	watt(s)
XML	Extensible Markup Language
°	degree
'	arc minute
±	plus or minus
%	percent

8. REFERENCES

[1] ISO 8879:1986, Standard Generalized Markup Language.

[2] Extensible Markup Language (XML) Specification: http://www.w3.org/XML/

[3] ISO 8601:2004(E), Data elements and interchange formats — Information interchange — Representation of dates and times

[4] IALA Recommendation R0203 (E-200-3) On Marine Signal Lights Part 3 - Measurement.

[5] IEC 60945 On Maritime navigation and radiocommunication equipment and systems – General requirements – Methods of testing and required test results.

ANNEX A SFEEAPI PRODUCT INFORMATION FILE TEMPLATE

To fill in a Product Information File (PIF) template manually using MS Word (version 2007 or above), proceed as follows:

1 Copy the template and rename it for use with a particular AtoN product, entering the manufacturer name (C), product model number (MMMMMMMM), serial number (SSSSSS), and date of creation (YYYYMMDD):

C_MMMMMMMM_SSSSSS_YYYYMMDD.XML

2 Move the mouse cursor on the new PIF file icon, open the right button menu, scroll down to the option 'Open With' and pick 'Microsoft Office Word'.

3 Once the document has been opened, move the mouse cursor to the data item input fields between XML tags (shown on a grey background and encapsulated in curved red frames) and enter the necessary information. In case of tags with pre-filled selection of strict classification strings, leave only a single relevant class (like BuoyLight) and delete the rest together with separators ('/').

Note: To get a better overview of the document, it is recommended to move the mouse cursor on any of the XML tags, open the right button menu, and select the option 'View XML structure'; this action results in the XML structure navigation window opening on the right side of the screen.

4 When the necessary information is entered, check it for correctness and save the file. Ignore the warning informing about the XML file in namespace {Unknown} being overwritten and proceed with overwriting the existing file by activating 'Yes'.

5 Browse to the icon of the PIF that was just created and double click on it to open the file in default XML viewer which is most likely a web browser.

Note: When it becomes necessary to duplicate some of the tag blocks like sector descriptions or references to documents, this can be accomplished directly inside MS Word environment by selecting and copying such tag blocks – just pay attention that a full block is copied and inserted into correct section, just below the preceding similar tag block. Entering proper date (and time where applicable) information helps to keep the entries in order.

Contents of the PIF template start on the next page.

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<IntensitySpecTemperature_deg> </IntensitySpecTemperature_deg>
<IntensityDegradation_h> </IntensityDegradation_h>
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<VerticalDivergenceFWHM_deg> </VerticalDivergenceFWHM_deg>
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</SpectrumColourCoordinates>
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<IntensityProtocolReference>
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```
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  <SectorUniformity> </SectorUniformity>
  <VerticalDivergenceFWHM_deg> </VerticalDivergenceFWHM_deg>
  <VerticalDivergenceFWTM_deg> </VerticalDivergenceFWTM_deg>
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   <ColourCoordinate_y> </ColourCoordinate_y>
   <ColourCoordinate_y_Uncertainty> </ColourCoordinate_y_Uncertainty>
   <ColourTemperature_K> </ColourTemperature_K>
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   </SpectrumProtocolReference>
  </SpectrumColourCoordinates>
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  <VertIntensityDistribution_degCd> </VertIntensityDistribution_degCd>
  <IntensityTempCurve_degCd> </IntensityTempCurve_degCd>
```

```
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      <ProtocolURL> </ProtocolURL>
      <DocSize_kB> </DocSize_kB>
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    <MeasDateTime> </MeasDateTime>
  </LightMeasurement>
</OpticalParameters>
<ElectricalParameters>
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  <ReversePolarityProtection> </ReversePolarityProtection>
  <SurgeProtection> </SurgeProtection>
  <PowerSupplyInrushCurrent_A> </PowerSupplyInrushCurrent_A>
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  <VoltageMinimum_V> </VoltageMinimum_V>
  <VoltageMaximum_V> </VoltageMaximum_V>
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  <FlashSynchronisation> </FlashSynchronisation>
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  <ControlCapability> </ControlCapability>
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  <BatteryTechnology> </BatteryTechnology>
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  <LightSensorType> </LightSensorType>
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```

```
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  <PowerConsumptionEclipse_W> </PowerConsumptionEclipse_W>
  <PowerConsumptionStandby_W> </PowerConsumptionStandby_W>
  <PowerConsumption_VW> </PowerConsumption_VW>
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  <VoltageMinCurrentConsumption_A> </VoltageMinCurrentConsumption_A>
  <VoltageMAXCurrentConsumption_A> </VoltageMAXCurrentConsumption_A>
  <PowerFactorAC> </PowerFactorAC>
  <CurrentUncertainty_A> </CurrentUncertainty_A>
  <VoltageUncertainty_V> </VoltageUncertainty_V>
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  <VoltageMAXCurrentConsumption_A> </VoltageMAXCurrentConsumption_A>
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   </ProtocolReference>
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  <NominalRangeDay_NM> </NominalRangeDay_NM>
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  <PowerCableLength_m> </PowerCableLength_m>
  <PowerCableType> </PowerCableType>
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  <LightSwitchingLevelOFF_lx> </LightSwitchingLevelOFF_lx>
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   <YearlyPercentage> </YearlyPercentage>
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  </IntensityDegradation>
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   <ConfAction> </ConfAction>
   <ModelName> </ModelName>
   <ModelModification>  </ModelModification>
   <PartOrderingNumber> </PartOrderingNumber>
   <ModelDescription> </ModelDescription>
   <SerialNumber> </SerialNumber>
   <Document>
    <DocClass>Drawing/Instructions/Protocol/Specification/Template/Other</DocClass>
    <DocName> </DocName>
    <DocURL> </DocURL>
```

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      <DocSize_kB> </DocSize_kB>
     </Document>
     <Comment> </Comment>
   </ConfigurationItem>
   <ChangeDateTime> </ChangeDateTime>
   <Comment> </Comment>
  </Configuration>
</ConfigurationLog>
<LifetimeEventLog>
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   <EventIdentNo> </EventIdentNo>
   <EventTimeStamp> </EventTimeStamp>
   <EventInformation> </EventInformation>
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   </Document>
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</LifetimeEventLog>
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   <FailureIdentNo> </FailureIdentNo>
   <FailureTimeStamp> </FailureTimeStamp>
   <FailureDescription> </FailureDescription>
   <RepairIdentNo> </RepairIdentNo>
   <RepairInformation> </RepairInformation>
   <RestoreTimeStamp> </RestoreTimeStamp>
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   </Document>
  <Comment> </Comment>
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```
  </Failure>
</FailureRepairLog>
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```

ANNEX B SFEEAPI PRODUCT INFORMATION FILE (PIF) DTD FOR VALIDATION

```
<?xml version="1.0" encoding="UTF-8"?>

<!ELEMENT ATON_PRODUCT_INFORMATION_FILE
(SFEEAPI_Compliance,ContentsClassification,ValidSinceDate,PIFCreator?,Product,Manufacturer,ContactInfo?,Ope
rationalParameters,PhysicalParameters,OpticalParameters,ElectricalParameters,ConfigurationLog?,LifetimeEvent
Log?,FailureRepairLog?,CustomContent?)>
<!ELEMENT SFEEAPI_Compliance (#PCDATA)>
<!ELEMENT ContentsClassification (#PCDATA)>
<!ELEMENT ValidSinceDate (#PCDATA)>
<!ELEMENT PIFCreator (#PCDATA)>

<!--Product section-->
<!ELEMENT Product
(ModelName,ModelModification?,HardwareVersion?,SoftwareVersion?,PartOrderingNumber?,ModelDescription,
SerialNumber?,ManufacturingDate?,ShippingDate?,WarrantyTermMonths,CountryOfOrigin?,ProductClass,LightSo
urceClass,ProductPicture*,UserManualURL?,ProductDocument*,Comment?)>
<!ELEMENT ModelName (#PCDATA)>
<!ELEMENT ModelModification (#PCDATA)>
<!ELEMENT HardwareVersion (#PCDATA)>
<!ELEMENT SoftwareVersion (#PCDATA)>
<!ELEMENT PartOrderingNumber (#PCDATA)>
<!ELEMENT ModelDescription (#PCDATA)>
<!ELEMENT SerialNumber (#PCDATA)>
<!ELEMENT ManufacturingDate (#PCDATA)>
<!ELEMENT ShippingDate (#PCDATA)>
<!ELEMENT WarrantyTermMonths (#PCDATA)>
<!ELEMENT CountryOfOrigin (#PCDATA)>
<!ELEMENT ProductClass (#PCDATA)>
<!ELEMENT LightSourceClass (#PCDATA)>
<!ELEMENT ProductPicture (PictureURL?,Caption?)>
<!ELEMENT PictureURL (#PCDATA)>
<!ELEMENT Caption (#PCDATA)>
<!ELEMENT UserManualURL (#PCDATA)>
<!ELEMENT ProductDocument (DocClass?,DocName?,DocURL?,DocSize_kB?)>
<!ELEMENT DocClass (#PCDATA)>
<!ELEMENT DocName (#PCDATA)>
```

<!ELEMENT DocURL (#PCDATA)>

<!ELEMENT DocSize_kB (#PCDATA)>

<!ELEMENT Comment (#PCDATA)>

<!--Manufacturer section-->

<!ELEMENT Manufacturer (Name,RegistrationNumber,VATNumber?,StreetAddress?,ZipCode?,City?,Country,Website?,Email?,Phone?,ContactPerson?,Comment?,ContractReference,PurchaserReference)>

<!ELEMENT Name (#PCDATA)>

<!ELEMENT RegistrationNumber (#PCDATA)>

<!ELEMENT VATNumber (#PCDATA)>

<!ELEMENT StreetAddress (#PCDATA)>

<!ELEMENT ZipCode (#PCDATA)>

<!ELEMENT City (#PCDATA)>

<!ELEMENT Country (#PCDATA)>

<!ELEMENT Website (#PCDATA)>

<!ELEMENT Email (#PCDATA)>

<!ELEMENT Phone (#PCDATA)>

<!ELEMENT ContactPerson (#PCDATA)>

<!ELEMENT ContractReference (#PCDATA)>

<!ELEMENT PurchaserReference (#PCDATA)>

<!--ContactInfo section-->

<!ELEMENT ContactInfo (Contact*)>

<!ELEMENT Contact (ContactClass?,Name?,RegistrationNumber?,VATNumber?,StreetAddress?,ZipCode?,City?,Country?,Website?,Email?,Phone?,ContactPerson?,Comment?)>

<!ELEMENT ContactClass (#PCDATA)>

<!--OperationalParameters section-->

<!ELEMENT OperationalParameters (ServiceLife_Y?,MTBF?,IngressProtectionClass?,EnvironmentTemperatureMin_degC,EnvironmentTemperatureMAX_degC,VibrationTolerance_g?,Maintenance?,Comment?)>

<!ELEMENT ServiceLife_Y (#PCDATA)>

<!ELEMENT MTBF (#PCDATA)>

<!ELEMENT IngressProtectionClass (#PCDATA)>

<!ELEMENT EnvironmentTemperatureMin_degC (#PCDATA)>

<!ELEMENT EnvironmentTemperatureMAX_degC (#PCDATA)>

<!ELEMENT VibrationTolerance_g (#PCDATA)>

<!ELEMENT Maintenance (Task*)>

<!ELEMENT Task (OperationalHours?,CalendarHours?,Description?,InstructionsURL?,DocSize_kB?)>

<!ELEMENT OperationalHours (#PCDATA)>

<!ELEMENT CalendarHours (#PCDATA)>

<!ELEMENT Description (#PCDATA)>

<!ELEMENT InstructionsURL (#PCDATA)>

<!--PhysicalParameters section-->

<!ELEMENT PhysicalParameters (Height_mm?,Width_mm?,Depth_mm?,Diameter_mm?,MountDescription?,BodyMaterial?,Weight_g,Comment?)>

<!ELEMENT Height_mm (#PCDATA)>

<!ELEMENT Width_mm (#PCDATA)>

<!ELEMENT Depth_mm (#PCDATA)>

<!ELEMENT Diameter_mm (#PCDATA)>

<!ELEMENT MountDescription (#PCDATA)>

<!ELEMENT BodyMaterial (#PCDATA)>

<!ELEMENT Weight_g (#PCDATA)>

<!--OpticalParameters section-->

<!ELEMENT OpticalParameters (LensDiameter_mm?,LensHeight_mm?,LensTiers?,FocalHeight_mm?,LensMaterial?,TypicalOptical+,LightMeasurement*)>

<!ELEMENT LensDiameter_mm (#PCDATA)>

<!ELEMENT LensHeight_mm (#PCDATA)>

<!ELEMENT LensTiers (#PCDATA)>

<!ELEMENT FocalHeight_mm (#PCDATA)>

<!ELEMENT LensMaterial (#PCDATA)>

<!ELEMENT TypicalOptical (Sector+,HorIntensityDistribution_degCd?,VertIntensityDistribution_degCd?,IntensityTempCurve_degCd?,IntensityProtocolReference*,Comment?,MeasDateTime?)>

<!ELEMENT Sector (SectorWidth_deg,SectorStart_deg?,SectorEnd_deg?,SectorUncertainty_deg?,BoundaryResolution_min?,(TypicalIntensity_cd|AverageIntensity_cd),IntensityUncertainty_cd?,(IntensityMeasTemperature_deg|IntensitySpecTemperature_deg)?,IntensityDegradation_h?,DegradationTempLimit_degC?,SectorUniformity?,VerticalDivergenceFWHM_deg,VerticalDivergenceFWTM_deg?,VerticalDivergenceUncertainty?,SectorColour,Wavelength_nm?,WavelengthUncertainty_nm?,SpectrumColourCoordinates?)>

<!ELEMENT SectorWidth_deg (#PCDATA)>

<!ELEMENT SectorStart_deg (#PCDATA)>

<!ELEMENT SectorEnd_deg (#PCDATA)>

<!ELEMENT SectorUncertainty_deg (#PCDATA)>

<!ELEMENT BoundaryResolution_min (#PCDATA)>

<!ELEMENT TypicalIntensity_cd (#PCDATA)>

<!ELEMENT AverageIntensity_cd (#PCDATA)>

<!ELEMENT IntensityUncertainty_cd (#PCDATA)>

<!ELEMENT IntensitySpecTemperature_deg (#PCDATA)>

<!ELEMENT IntensityDegradation_h (#PCDATA)>

<!ELEMENT DegradationTempLimit_degC (#PCDATA)>

<!ELEMENT SectorUniformity (#PCDATA)>

<!ELEMENT VerticalDivergenceFWHM_deg (#PCDATA)>

<!ELEMENT VerticalDivergenceFWTM_deg (#PCDATA)>

<!ELEMENT VerticalDivergenceUncertainty (#PCDATA)>

<!ELEMENT SectorColour (#PCDATA)>

<!ELEMENT Wavelength_nm (#PCDATA)>

<!ELEMENT WavelengthUncertainty_nm (#PCDATA)>

<!ELEMENT SpectrumColourCoordinates (ColourCoordinate_x?,ColourCoordinate_x_Uncertainty?,ColourCoordinate_y?,ColourCoordinate_y_Uncertainty?, ColourTemperature_K?,ColourTemperatureUncertainty_K?,SpectrumProtocolReference*)>

<!ELEMENT ColourCoordinate_x (#PCDATA)>

<!ELEMENT ColourCoordinate_x_Uncertainty (#PCDATA)>

<!ELEMENT ColourCoordinate_y (#PCDATA)>

<!ELEMENT ColourCoordinate_y_Uncertainty (#PCDATA)>

<!ELEMENT ColourTemperature_K (#PCDATA)>

<!ELEMENT ColourTemperatureUncertainty_K (#PCDATA)>

<!ELEMENT SpectrumProtocolReference (DescriptionNR?,ProtocolURL?,DocSize_kB?)>

<!ELEMENT DescriptionNR (#PCDATA)>

<!ELEMENT ProtocolURL (#PCDATA)>

<!ELEMENT HorIntensityDistribution_degCd (#PCDATA)>

<!ELEMENT VertIntensityDistribution_degCd (#PCDATA)>

<!ELEMENT IntensityTempCurve_degCd (#PCDATA)>

<!ELEMENT IntensityProtocolReference (DescriptionNR?,ProtocolURL?,DocSize_kB?)>

<!ELEMENT MeasDateTime (#PCDATA)>

<!ELEMENT LightMeasurement (Sector*,HorIntensityDistribution_degCd?,VertIntensityDistribution_degCd?,IntensityTempCurve_degCd?,IntensityProtocolReference*,Comment?,MeasDateTime?)>

<!ELEMENT IntensityMeasTemperature_deg (#PCDATA)>

<!--ElectricalParameters section-->

<!ELEMENT ElectricalParameters (TypicalElectrical+,PowerMeasurement*)>

<!ELEMENT TypicalElectrical (CurrentType,PowerSupplyType?,ReversePolarityProtection?,SurgeProtection?,PowerSupplyInrushCurrent_A?,VoltageNominal_V,VoltageMinimum_V?,VoltageMaximum_V?,LightSourceRegulation?,FlashSynchronisation?,ExtControlOfFlashing?,MonitoringCapability?,ControlCapability?,SolarCellType?,SolarCellPower_W?,SolarCellNumber?,BatteryType?,BatteryCapacity?,BatteryTechnology?,BatteryVoltage_V?,BatteryNumber?,FlasherType?,LightSensorType?,PowerConsumption+)>

<!ELEMENT CurrentType (#PCDATA)>

<!ELEMENT PowerSupplyType (#PCDATA)>

<!ELEMENT ReversePolarityProtection (#PCDATA)>

<!ELEMENT SurgeProtection (#PCDATA)>

<!ELEMENT PowerSupplyInrushCurrent_A (#PCDATA)>

<!ELEMENT VoltageNominal_V (#PCDATA)>

<!ELEMENT VoltageMinimum_V (#PCDATA)>

<!ELEMENT VoltageMaximum_V (#PCDATA)>

<!ELEMENT LightSourceRegulation (#PCDATA)>

<!ELEMENT FlashSynchronisation (#PCDATA)>

<!ELEMENT ExtControlOfFlashing (#PCDATA)>

<!ELEMENT MonitoringCapability (#PCDATA)>

<!ELEMENT ControlCapability (#PCDATA)>

<!ELEMENT SolarCellType (#PCDATA)>

<!ELEMENT SolarCellPower_W (#PCDATA)>

<!ELEMENT SolarCellNumber (#PCDATA)>

<!ELEMENT BatteryType (#PCDATA)>

<!ELEMENT BatteryCapacity (#PCDATA)>

<!ELEMENT BatteryTechnology (#PCDATA)>

<!ELEMENT BatteryVoltage_V (#PCDATA)>

<!ELEMENT BatteryNumber (#PCDATA)>

<!ELEMENT FlasherType (#PCDATA)>

<!ELEMENT LightSensorType (#PCDATA)>

<!ELEMENT PowerConsumption (PowerConsumptionMode,PowerConsumptionFlash_W,PowerConsumptionEclipse_W?,PowerConsumptionStandby_W?,PowerConsumption_VW?,PowerSpecTemperature_degC?,VoltageNomCurrentConsumption_A?,VoltageMinCurrentConsumption_A?,VoltageMAXCurrentConsumption_A?,PowerFactorAC?,CurrentUncertainty_A?,VoltageUncertainty_V?,ProtocolReference*,Comment?,MeasDateTime?)>

<!ELEMENT PowerConsumptionMode (#PCDATA)>

<!ELEMENT PowerConsumptionFlash_W (#PCDATA)>

<!ELEMENT PowerConsumptionEclipse_W (#PCDATA)>

<!ELEMENT PowerConsumptionStandby_W (#PCDATA)>

<!ELEMENT PowerConsumption_VW (#PCDATA)>

<!ELEMENT PowerSpecTemperature_degC (#PCDATA)>

<!ELEMENT VoltageNomCurrentConsumption_A (#PCDATA)>

<!ELEMENT VoltageMinCurrentConsumption_A (#PCDATA)>

<!ELEMENT VoltageMAXCurrentConsumption_A (#PCDATA)>

<!ELEMENT PowerFactorAC (#PCDATA)>

<!ELEMENT CurrentUncertainty_A (#PCDATA)>

<!ELEMENT VoltageUncertainty_V (#PCDATA)>

<!ELEMENT ProtocolReference (DescriptionNR?,ProtocolURL?,DocSize_kB?)>

<!ELEMENT PowerMeasurement (PowerConsumptionMode?,PowerConsumptionFlash_W?,PowerConsumptionEclipse_W?,PowerMeasTemperature_degC?,VoltageNomCurrentConsumption_A?,VoltageMinCurrentConsumption_A?,VoltageMAXCurrentConsumption_A?,PowerFactorAC?,CurrentUncertainty_A?,VoltageUncertainty_V?,ProtocolReference*,Comment?,MeasDateTime?)>

<!ELEMENT PowerMeasTemperature_degC (#PCDATA)>

<!--ConfigurationLog section-->

<!ELEMENT ConfigurationLog (Configuration*)>

<!ELEMENT Configuration (Name?,FirmwareVersion?,FlashCharacter?,PWMDutyCycle?,NominalRangeNight_NM?,NominalRangeDay_NM?,PowerAutonomy_h?,PowerCableLength_m?,PowerCableType?,LightSwitchSetting?,DayNightSwitchingLevel_lx?,LightSwitchingLevelON_lx?,LightSwitchingLevelOFF_lx?,DayNightSwitchingDelay_s?,IntensityDegradation*,ConfigurationItem*,ChangeDateTime?,Comment?)>

<!ELEMENT FirmwareVersion (#PCDATA)>

<!ELEMENT FlashCharacter (#PCDATA)>

<!ELEMENT PWMDutyCycle (#PCDATA)>

<!ELEMENT NominalRangeNight_NM (#PCDATA)>

<!ELEMENT NominalRangeDay_NM (#PCDATA)>

<!ELEMENT PowerAutonomy_h (#PCDATA)>

<!ELEMENT PowerCableLength_m (#PCDATA)>

<!ELEMENT PowerCableType (#PCDATA)>

<!ELEMENT LightSwitchSetting (#PCDATA)>

<!ELEMENT DayNightSwitchingLevel_lx (#PCDATA)>

<!ELEMENT LightSwitchingLevelON_lx (#PCDATA)>

<!ELEMENT LightSwitchingLevelOFF_lx (#PCDATA)>

<!ELEMENT DayNightSwitchingDelay_s (#PCDATA)>

<!ELEMENT IntensityDegradation (Colour?,YearlyPercentage?,SourceTemperature_degC?)>

<!ELEMENT Colour (#PCDATA)>

<!ELEMENT YearlyPercentage (#PCDATA)>

<!ELEMENT SourceTemperature_degC (#PCDATA)>

<!ELEMENT ConfigurationItem (ConfAction?,ModelName?,ModelModification?,PartOrderingNumber?,ModelDescription?,SerialNumber?,Document*,Comment?)>

<!ELEMENT ConfAction (#PCDATA)>

<!ELEMENT Document (DocClass?,DocName?,DocURL?,DocSize_kB?)>

<!ELEMENT ChangeDateTime (#PCDATA)>

<!--LifeTimeEventLog section-->

<!ELEMENT LifetimeEventLog (Event*)>

<!ELEMENT Event (EventType?,EventIdentNo?,EventTimeStamp?,EventInformation?,Document*)>

<!ELEMENT EventType (#PCDATA)>

<!ELEMENT EventIdentNo (#PCDATA)>

<!ELEMENT EventTimeStamp (#PCDATA)>

<!ELEMENT EventInformation (#PCDATA)>

<!--FailureRepairLog section-->

<!ELEMENT FailureRepairLog (Failure*)>

<!ELEMENT Failure (FailureClass?,FailureIdentNo?,FailureTimeStamp?,FailureDescription?,RepairIdentNo?,RepairInformation?,RestoreTimeStamp?,Document*,Comment?)>

<!ELEMENT FailureClass (#PCDATA)>

<!ELEMENT FailureIdentNo (#PCDATA)>

<!ELEMENT FailureTimeStamp (#PCDATA)>

<!ELEMENT FailureDescription (#PCDATA)>

<!ELEMENT RepairIdentNo (#PCDATA)>

<!ELEMENT RepairInformation (#PCDATA)>

<!ELEMENT RestoreTimeStamp (#PCDATA)>

<!--CustomContent section-->

<!ELEMENT CustomContent (CustomData*)>

<!ELEMENT CustomData (CustomDataItemName?,Value?,Description?,DateTime?)>

<!ELEMENT CustomDataItemName (#PCDATA)>

<!ELEMENT Value (#PCDATA)>

<!ELEMENT DateTime (#PCDATA)>

ANNEX C SFEEAPI PRODUCT INFORMATION FILE CONTENT EXAMPLE

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<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE ATON_PRODUCT_INFORMATION_FILE SYSTEM "SFEEAPI.dtd">
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<SFEEAPI_Compliance>1.0</SFEEAPI_Compliance>
<ContentsClassification>Public</ContentsClassification>
<ValidSinceDate>20120427</ValidSinceDate>
<PIFCreator>Xerlin XML Editor</PIFCreator>
<Product>
 <ModelName>AtoN Lantern No1 </ModelName>
 <ModelModification>R</ModelModification>
 <PartOrderingNumber>112233-44</PartOrderingNumber>
 <ModelDescription>1NM Red AtoN Lantern (requires external flasher)</ModelDescription>
 <SerialNumber>110123456</SerialNumber>
 <ManufacturingDate>20110901</ManufacturingDate>
 <ShippingDate>20111013</ShippingDate>
 <WarrantyTermMonths>24</WarrantyTermMonths>
 <CountryOfOrigin>France</CountryOfOrigin>
  <ProductClass>BuoyLight</ProductClass>
 <LightSourceClass>LED</LightSourceClass>
 <ProductPicture>
  <PictureURL>AtoN_Lantern_No1_pic.png</PictureURL>
  <Caption> AtoN Lantern No1, front view</Caption>
 </ProductPicture>
 <UserManualURL>AtoN_Lantern_No1_Instructions_for_Use_v.1.pdf</UserManualURL>
 <ProductDocument>
 <DocClass>Instructions</DocClass>
  <DocName>AtoN Lantern No1. Installation Instructions</DocName>
  <DocURL>No1_Inst_instructions.pdf</DocURL>
  <DocSize_kB>100</DocSize_kB>
 </ProductDocument>
 <Comment> </Comment>
</Product>
<Manufacturer>
 <Name>AtoN Lantern manufacturer Ltd</Name>
```

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  <VATNumber>FR-9876543</VATNumber>
  <StreetAddress>Rue de Dumas</StreetAddress>
  <ZipCode>112233</ZipCode>
  <City>Marseille</City>
  <Country>France</Country>
  <Website>http://www.buoy1.com/</Website>
  <Email> mail@buoycompany.com</Email>
  <Phone> </Phone>
  <ContactPerson> </ContactPerson>
  <Comment> </Comment>
   <ContractReference>9977553311</ContractReference>
     <PurchaserReference>Mr. Alexander Buyer</PurchaserReference>
</Manufacturer>
<ContactInfo>
 <Contact>
  <ContactClass>Distributor/Maintenance/Repair/TechSupport/Other </ContactClass>
  <Name> </Name>
  <RegistrationNumber> </RegistrationNumber>
  <VATNumber> </VATNumber>
  <StreetAddress> </StreetAddress>
  <ZipCode> </ZipCode>
  <City> </City>
  <Country> </Country>
  <Website> </Website>
  <Email> </Email>
  <Phone> </Phone>
  <ContactPerson> </ContactPerson>
  <Comment> </Comment>
 </Contact>
</ContactInfo>
<OperationalParameters>
  <ServiceLife_Y> </ServiceLife_Y>
  <MTBF> </MTBF>
  <IngressProtectionClass> </IngressProtectionClass>
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  <VibrationTolerance_g> </VibrationTolerance_g>
  <Maintenance>
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    <OperationalHours> </OperationalHours>
    <CalendarHours> </CalendarHours>
    <Description> </Description>
     <InstructionsURL> </InstructionsURL>
     <DocSize_kB> </DocSize_kB>
   </Task>
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