Johannesburg Stock Exchange

Equity Market Trading and Information Solution

JSE Specification Document
JSE SENS Real Time NewsML

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1 DOCUMENT CONTROL

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1.1 Document Information

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Date	Version	Sections	Description
24 January 2012	1.00		Initial Draft
4 June 2012	1.01	4.3.2	Correction on company role for Exchange Announcements
		6	Updated to reflect correct URL
		6.3	Updated to reflect correct URL
		6.6.2	Added note on handling white space in alpha codes and optionality of TIDM codes for certain instruments.
		6.6.3	Update to reflect correct URL
		6.7.2	Added additional info regarding URL for Remote Content
		7.5	Updated section to reflect updated notification policy and download location.
		8.0	Section removed as the URs are now provided at the relevant points in the document.
30 June 2012	1.02	6.7.1	Added guidance for processing text content.
		7.5	Add URL for taxonomy viewer.
19 January 2019	1.03	6.7.2	Additional remoteContent attribute for financial results document.

1.3 References

Volume 8 – Regulatory News Feed (FAST – UDP)

1.4   Contact Details

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2 AUDIENCE AND PRE-REQUISITES

This document is intended to be used by software developers as a reference document to the JSE NewsML specification implemented within the JSE Stock Exchange News Service (SENS). The document is specifically geared towards developers writing software to process the embedded NewsML created for real time news announcements.

Note: The JSE provides an End-of-Day News product in NewsML via InfoMax however a separate specification document is provided for this product.

This document assumes the reader is familiar with the NewsML-G2 standard version 2.9 (referenced herein as 'NewsML'). Please refer to the IPTC online documentation (www.iptc.org) and the *IPTC-G2-Implemention-Guide_4.0* and *NewsML-G2-2.9-PCL-1* documents for more details on the standard.

This document focuses on the specific details of how NewsML is implemented by the JSE in the SENS service and not as a general guide to the NewsML standard itself.

3 OVERVIEW

SENS/NENS is a regulatory news service provided by the JSE/NSX for its listed companies to publish news to the market as required by the listing requirements of the JSE/NSX. SENS/NENS is also used by regulatory institutions to publish announcements to the market. The JSE and NSX also use the service to publish Exchange Announcements.

The news announcements are submitted by authorised JSE submitters to the JSE in PDF file format via the JSE SENS/NENS web frontend. Authorised JSE submitters can submit stories in a plain-text format or in PDF file format only. The PDF file may contain a mixture of text and graphics/pictures. The received PDF file is converted by the JSE SENS/NENS application using a PDF-to-Text converter into plain-text (Windows-1252) news announcement format.

The SENS/NENS application uses the plain-text news announcement format along with information provided by the authorised JSE submitters on the SENS/NENS web frontend and passes the news announcement on for processing and publication to the real time subscription clients.

The PDF news announcements for JSE and NSX will be hosted on the JSE website and will be available to clients that subscribe to this service. The plain-text version of the news announcement is included in the inline content of the NewsML created for the real time News messages. The NewsML is embedded in the *EncodedText* field of the *FIX News Message* (Message Type = 'B') and disseminated by the JSE and NSX Regulatory News Gateways[1].

The Namibian Stock Exchange (NSX) is a user of the JSE SENS system. NSX news messages are disseminated using an independent service called NENS (Namibian Exchange News Service). For simplicity, this document will henceforth usually refer to JSE/SENS but NSX/NENS applies equally unless otherwise indicated.

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[1] Please see Volume 8 – Regulatory News Feed (FAST – UDP)

4 CATEGORY OF ANNOUNCEMENTS

The category of an announcement influences how the FIX and NewsML messages are populated. This section describes the various categories of announcement and their impact on the news messages.

4.1 Dual-listed vs. Single-listed Announcements

In SENS/NENS, a dual-listed announcement applies to companies which are listed on both the JSE and NSX. For JSE/NSX dual-listed announcements, two news messages (in both FIX and NewsML) are created; each message contains only those companies and instruments associated with the respective Exchanges. Once the two separate announcements have been created, each announcement is then further categorised as per Section 4.2 and Section 4.3.

4.2 Company Announcements vs. General Announcements

When an announcement is made by a company which is authorised to list instruments (i.e. it has a role of Equity Issuer, Warrant Issuer, etc.) it is considered a Company Announcement. If the announcement is made by a company or organisation with a role other than an Issuer Role then it is considered a General Announcement.

If an Issuer has listed instruments and is submitting the announcement under its Issuer Role then it must select at least one instrument to be linked to the announcement. Note that a Company Announcement can be made by an Issuer that does not have any listed instruments on the Exchange.

A General announcement will have no linked instruments to the announcement.

The NewsML metadata for companies and instruments will reflect whether any instruments are linked to the announcement or not.

4.3 Regulatory vs. Non-Regulatory Announcements

4.3.1 Non-Regulatory Announcements

When a company announcement is issued, it can pertain to one or more companies. The first company entered by the submitter is known as the *primary company* (or *issuer*); if there are other companies, they are known as *related companies* (or *issuers*).

If the primary company does list a share, the announcement is considered *non-regulatory*; this applies even if one or more related companies (if applicable) do not list any shares.

The *AnnouncementGroupCode* element will not be present in the NewsML message.

The *AnnouncementRegulatoryCode* in the NewsML message will have the value *'N' (non-regulatory)*.

The company and instrument metadata will be populated for all the companies and instruments linked to the announcement.

4.3.2 Regulatory Announcements

Regulatory announcements do not have listed instruments linked to the announcement. The following are the sub-categories of Regulatory Announcements:

4.3.2.1 Exchange Announcements

Exchange announcements are announcements issued by the JSE and NSX. No instruments are linked to the announcement. Related companies are not allowed under Exchange Announcements.

Note: If the JSE makes an announcement about its listed shares it would do so under its Equity Issuer role and therefore the announcement would not be considered an Exchange Announcement but a normal Company Announcement.

4.3.2.2 Regulatory Institution Announcements

Announcements by Regulatory Institutions (e.g. FSB, CCO and TRP) may relate to a particular Issuer Company but generally apply to the Market as a whole. No instruments are linked to the announcement. Related companies are not allowed for Regulatory Institution Announcements.

4.3.2.3 Company Announcements (Issuer without listed instruments)

When a company announcement is issued, it can pertain to one or more companies. The first company entered by the submitter is known as the *primary company* (or *issuer*); if there are other companies, they are known as *related companies* (or *issuers*). If the primary company of the announcement does not list any shares (there are no instruments to select from), then the announcement is deemed *regulatory*. If the announcement has other companies and they have listed instruments, the announcement is still *regulatory* as the categorisation applies to the Primary Company.

The type of regulatory announcement is identified by the Announcement Group Code as shown in Table 1 below:

Table 1 – Announcement Group Codes

Market Segment ID / Announcement Group Code	Announcement Category	Description
CCO	Regulatory Institution	Competition Commission
CTR	Regulatory Institution	Competition Tribunal
TRP	Regulatory Institution	Takeover Regulation Panel
FSB	Regulatory Institution	Financial Services Board
EXCH	Exchange Announcement (JSE & NSX)	Exchange
JSEO	JSE Primary Company (without instruments)	Other JSE
NSXO	NSX Primary Company (without instruments)	Other NSX

The Announcement Regulatory Code in the NewsML message will have the value *'R' (regulatory)*.

The metadata for the primary company or organisation (Regulatory Institution, Exchange or Company) will be populated in the NewsML. The instrument metadata will not be populated as they do not apply to regulatory announcements.

5 JSE NEWSML OVERVIEW

NewsML-G2 (News Markup Language, 2nd Generation) in a messaging standard used by the news industry for news exchange and distribution. The standard is regulated by the International Press and Telecommunications Council (IPTC), and is part of the G2-Standards suite. Please refer to IPTC specifications online[2] for more details on the standard.

A subset of the NewsML-G2 standard version 2.9 ("JSE NewsML" herein) is used in SENS with some extensions to cater for specific SENS requirements.

JSE NewsML uses the G2 **newsItem** container for the actual SENS announcements and its associated metadata.

The **packageItem** is used to group announcements as an end-of-day package for InfoMax products but is not discussed in this document.

The **knowledgeItem** container is used to define the concepts used in the newsItem and packageItem.

The **catalog** defines the set of scheme declarations in use by a news provider for a given G2 Item.

JSE NewsML does *not* make use of the **conceptItem** container.

JSE NewsML does *not* make use of the **newsMessage** container as a FIX News Message is used to deliver the NewsML in the JSE intraday news feeds.

The related EventsML-G2 and SportsML-G2 standards are *not* used in SENS.

6 NEWSITEM – REPRESENTING NEWS

The **newsItem** is the top-level element of a JSE NewsML document which conveys an announcement and contains the following sub-elements:

- **itemMeta** to provide Management Metadata information about the newsItem document;

- **contentMeta** to provide Content Metadata information about the news content contained in the document; and

- **contentSet** to provide a Content Payload to contain the actual news content

Listing 1 below is a sample SENS newsItem as will be embedded within the JSE SENS real time messages. The message is a 'replacement' of a previous announcement by Investec Limited. A replacement announcement has been used as it covers all the NewsML elements of a standard news announcement but provides additional information on how corrections and versioning is handled.

NB: The information shown in all code listings in this document are for explanatory purposes and may not reflect actual news announcements. The Usage Terms, Headline and Announcement Text have been abbreviated to simplify the code listing.

NB: The JSE will provide JSE SENS real time canned data to clients for testing purposes once the SENS replay tool is launched in the Customer Test Service.

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[2] http://www.iptc.org/site/News_Exchange_Formats/NewsML-G2/

Listing 1 – Sample SENS newsItem: JSE SENS Real Time

```xml
<?xml version="1.0" encoding="Windows-1252"?>
<newsItem xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
          xmlns:sens="http://JSE/Schemas/SENS/NewsML/Extensions/"
          xmlns="http://iptc.org/std/nar/2006-10-01/"
          guid="urn:newsml:jse.co.za:2011-12-28:SENS:S300428:ITNI"
          version="1"
          standard="NewsML-G2"
          standardversion="2.9"
          conformance="power"
          xml:lang="en">
  <catalogRef href="http://www.jse.co.za/is/sens/newsml/catalog/JSE_NewsML_Catalog_1.xml" />
  <catalogRef href="http://www.iptc.org/std/catalog/catalog.IPTC-G2-Standards_17.xml" />
  <rightsInfo>
    <copyrightHolder literal="JSE Limited" />
    <copyrightNotice>Copyright 2011 JSE Limited. All rights reserved.</copyrightNotice>
    <usageTerms>The SENS usage terms (...)</usageTerms>
  </rightsInfo>
  <itemMeta>
    <itemClass qcode="ninat:composite" />
    <provider literal="JSE Limited" />
    <versionCreated>2011-12-28T15:12:38.763Z</versionCreated>
    <firstCreated>2011-12-28T15:12:38.763Z</firstCreated>
    <embargoed>2011-12-28T15:12:00.000Z</embargoed>
    <pubStatus qcode="stat:usable" />
    <fileName>SENS_20111228_S300428_ITNI.XML</fileName>
    <generator versioninfo="1.0.0.0">JSE.IS.Sens.NewsML</generator>
    <service qcode="SrvTyp:SENS" />
    <signal qcode="CorTyp:Repl" />
    <link contenttype="application/vnd.iptc.g2.newsitem+xml"
          rel="irel:previousVersion"
          residref="urn:newsml:jse.co.za:2011-12-28:SENS:S300425:ITNI">
      <altId type="AltIdTyp:AnnRefNo">S300425</altId>
      <altId type="AltIdTyp:AnnNo">201112280001A</altId>
    </link>
  </itemMeta>
  <contentMeta>
    <urgency>1</urgency>
    <contentCreated>2011-12-28T15:10:30.450Z</contentCreated>
    <located literal="Johannesburg" />
    <infoSource qcode="OrgId:1207" />
    <creator qcode="OrgId:1207" />
    <audience qcode="PrdCde:ITNI" />
    <altId type="AltIdTyp:AnnNo">201112280004A</altId>
    <altId type="AltIdTyp:AnnRefNo">S300428</altId>
    <language tag="en" />
    <genre qcode="RelTyp:100" />
    <headline>Director Dealing In Securities - added preference share</headline>
    <subject qcode="AnnTyp:123">
      <name>Dealings</name>
      <narrower qcode="AnnSubTyp:125">
        <name>by Director</name>
      </narrower>
    </subject>
    <subject qcode="OrgId:1207" />
    <subject qcode="InsNumCde:193" />
    <subject qcode="InsNumCde:6727" />
    <sens:AnnouncementRegulatoryCode qcode="AnnRegCde:N" />
    <sens:PriceSensitivityIndicator qcode="PrcSenInd:Y" />
  </contentMeta>
  <assert qcode="OrgId:1207">
    <related rel="RelNat:hasRelSeq" literal="1" />
    <related rel="RelNat:hasRole" qcode="AnnRol:ISSE" />
    <related rel="RelNat:hasRoleOn" qcode="MIC:XJSE" />
    <related rel="RelNat:isRegisteredIn" qcode="iso3166-1a2:ZA" />
    <sameAs qcode="OrgAlphaCde:INL" />
    <name role="nrol:short">INVLTD</name>
    <name role="nrol:full">INVESTEC LIMITED</name>
  </assert>
  <assert qcode="InsNumCde:193">
    <related rel="RelNat:hasRelSeq" literal="1" />
    <related rel="RelNat:isIssuedBy" qcode="OrgId:1207" />
    <related rel="RelNat:isIssuedIn" qcode="iso3166-1a2:ZA" />
```

```xml
      <related rel="RelNat:hasListingType" qcode="LstTyp:Primary" />
      <related rel="RelNat:isListedOn" qcode="MIC:XJSE" />
      <related rel="RelNat:isListedOn" qcode="MktTyp:EM" />
      <related rel="RelNat:isListedOn" qcode="BrdTyp:Main" />
      <related rel="RelNat:hasSubSector" qcode="ICBSubSec:8777" />
      <sameAs qcode="isin:ZAE000081949" />
      <sameAs qcode="TIDM:101G" />
      <sameAs qcode="InsAlphaCde:INL" />
      <name role="nrol:short">INVLTD</name>
      <name role="nrol:full">Investec Ltd</name>
    </assert>
    <assert qcode="InsNumCde:6727">
      <related rel="RelNat:hasRelSeq" literal="2" />
      <related rel="RelNat:isIssuedBy" qcode="OrgId:1207" />
      <related rel="RelNat:isIssuedIn" qcode="iso3166-1a2:ZA" />
      <related rel="RelNat:hasListingType" qcode="LstTyp:Primary" />
      <related rel="RelNat:isListedOn" qcode="MIC:XJSE" />
      <related rel="RelNat:isListedOn" qcode="MktTyp:EM" />
      <related rel="RelNat:isListedOn" qcode="BrdTyp:Main" />
      <related rel="RelNat:hasSubSector" qcode="ICBSubSec:A221" />
      <sameAs qcode="isin:ZAE000063814" />
      <sameAs qcode="TIDM:13KI" />
      <sameAs qcode="InsAlphaCde:INPR" />
      <name role="nrol:short">INVLTD PREF</name>
      <name role="nrol:full">Investec Ltd Pref</name>
    </assert>
  <contentSet>
   <remoteContent contenttype="application/pdf" size="130187"
href="\Common\DDAP.SPRD.SENS.STORIES\SENS_20111228_S300425.pdf;https://senspdf.jse.co.za/cts/2019/jse/isse/att/nam.pdf" />
   <inlineData contenttype="text/plain" xml:space="preserve">Announcement plain text
in Windows-1252
   </inlineData>
  </contentSet>
</newsItem>
```

6.1 XML Version and Encodings

The first line of the newsItem is standard XML. The newsItem uses version 1.0 of the W3C XML standard. The encoding Windows-1252 encoding is used in SENS/NENS; the first line of a JSE NewsML newsItem is:

```xml
<?xml version="1.0" encoding="Windows-1252"?>
```

The XML created by SENS/NENS removes any illegal XML characters by escaping them. In addition, all URLs and URIs used in SENS/NENS conform to the valid character sets as defined in RFC3986.

NB: JSE NewsML does not currently support Unicode UTF-8/16/32.

6.2 NewsItem attributes

The newsItem for JSE NewsML have the following attributes:

```xml
<newsItem xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
          xmlns:sens="http://JSE/Schemas/SENS/NewsML/Extensions/"
          xmlns="http://iptc.org/std/nar/2006-10-01/"
          guid="urn:newsml:jse.co.za:2011-12-28:SENS:S300428:ITNI"
          version="1"
          standard="NewsML-G2"
          standardversion="2.9"
          conformance="power"
          xml:lang="en">
```

6.2.1 Identification

JSE NewsML uses the URN namespace (*urn:newsml*) as the GUID for identification of NewsML-G2 items (RFC3085). The URN has the form:

urn:newsml:<provider>:<PublicationDate>:<unique-identifier-for-the-provider>

Example:

urn:newsml:jse.co.za:2011-12-21:SENS:S300428:ITNI

where <provider> is set to the JSE domain address (for both SENS and NENS) and PublicationDate (CCYY-MM-DD) is set to the date the news was published. The <unique-identifier-for-the-provider> is further defined by:

<ServiceID>:<AnnRefNo>:<ItemType>

For JSE announcements, *ServiceID* is set to SENS, whilst for NSX announcements it is set to NENS.

The *AnnRefNo* (Announcement Reference Number) field uniquely identifies an announcement. The format of this field is an alphanumeric code starting with "S" and followed by a numeric value, e.g. S300428. The AnnRefNo is valid for all time.

The ItemType is an indicator for the type of NewsItems, e.g. ITNI is the value used for the SENS Real Time NewsML Messages

NB: The GUID string above may be created deterministically but it is considered <u>opaque</u> – its 'format' is not guaranteed and consumers MUST NOT parse it. The metadata contained in the GUID is provided in its own right in the JSE NewsML. (Please see Appendix A for a list of the opaque strings used in JSE NewsML).

6.2.2 NewsItem Versioning and Corrections

The simplest NewsML-G2 mechanism for dealing with updated content is to re-issue an item using the same GUID with a new Version. However, some content systems do not provide a common identifier for updated content and previous versions of the same content. In these cases, it may not be possible to use the GUID to identify previous versions, and the provider would need to use **link** to refer to the GUID of a previous version, using @residref.

JSE NewsML uses the **link** element to link NewsItems to previous versions. The *@version* attribute is *not* used track versions of the same NewsItem.

The relationship between the current NewsItem and the NewsItem referenced by **link** is expressed using @rel. The appropriate code value from the IPTC Item Relation NewsCode is "previousVersion":

A *cancellation or replacement* announcement is considered a new announcement in SENS and will therefore have a different GUID and have @version set to 1. The cancellation and replacement announcements will have a **link** to the NewsItem being replaced, e.g.:

```
version="1"
```

Please see section 6.8 for additional information on announcement corrections.

XML Namespaces

The IPTC namespace for NewsML (G2 v2.9) and W3C namespace for XML schema are as follows:

```
xmlns="http://iptc.org/std/nar/2006-10-01/"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
```

The SENS extensions to the NewsML standard are indicated by the following namespace:

```
xmlns:sens="http://JSE/Schemas/SENS/NewsML/Extensions/"
```

6.2.3 Indication of Compliance with a Standard and Conformance Level

The NewsML-G2 standard is used for JSE NewsML:

```
standard="NewsML-G2"
```

JSE NewsML is based on version 2.9 of NewsML-G2:

```
standardversion="2.9"
```

The Power Conformance Level (PCL) is used for JSE NewsML for additional capabilities:

```
conformance="power"
```

6.2.4 XML Language Attribute

Unless locally overridden, JSE NewsML specifies "English" as the default language for news using BCP47 tag 'en':

```
xml:lang="en">
```

6.3 Catalogs

The IPTC Catalog and JSE Catalog used in JSE NewsML lists all the Controlled Vocabularies (CVs) aliases and their URIs.

IMPORANT: It is strongly recommended that a G2 processor should cache any remote catalogs to avoid processing dependencies on external servers. Any changes to the catalogs used in SENS will be formally communicated by the JSE according to standard notification policies.

A new version of the JSE NewsML Catalog will issued for all changes, including adding, updating or deleting scheme aliases. A 'major' versioning number will be appended to the catalog name, e.g. JSE_NewsML_Catalog_**1.**xml, JSE_NewsML_Catalog_**2**.xml, etc. Minor versioning is NOT used. Old catalogs are maintained on the JSE website indefinitely.

The [JSE NewsML Catalog](https://www.jse.co.za/services/technologies/equity-market-trading-and-information-technology-change) can be downloaded from the following URL:
https://www.jse.co.za/services/technologies/equity-market-trading-and-information-technology-change

6.3.1 JSE Controlled Vocabularies (CV) Published in SENS knowledgeItem

The following table lists the CVs that are maintained by the JSE:

Table 2 – JSE Controlled Vocabularies published in the SENS Knowledge Item

Controlled Vocabulary	Alias	Description
Release Type	RelTyp	Describes the Release Type, e.g. Formal, Press Release, etc.
Service Type	SrvTyp	Describes the type of service used to distribute the announcement, e.g. SENS, NENS.
Announcement Type	AnnTyp	Identifier for the type of announcement, e.g. Merger, Acquisition, etc.
Announcement Sub Type	AnnSubTyp	Identifier for the announcement subtype, e.g. Full Redemption, Partial Redemption (subtypes of *Redemption* Announcement Type).
Relationship Nature	RelNat	Describes the relationship nature between two concepts.
Announcement Role	AnnRol	Describes the type of role of an organisation in an announcement, e.g. Equity Issuer, Warrant Issuer.
Market Type	MktTyp	Describes the Market an instrument is listed on, e.g. Equity Market, Derivatives Market, etc.
Board Type	BrdTyp	Describes the Type of Board an instrument is listed on, e.g. Main Board, Alt-X, Africa Board, etc.
Correction Type	CorTyp	Describes the possible corrections to G2 Items, e.g. Cancellation and Replacement.
Alternative Identifier Type	AltIdTyp	Used to provide alternative identifiers for concepts, e.g. TIDM and ISIN for instruments.
Price Sensitivity Indicator	PrcSenInd	Describes the price sensitivity of an announcement, e.g. Y, N. The price sensitivity is determined by the announcement submitter.
Announcement Regulatory Code	AnnRegCde	Used to categorise announcements as either regulatory or non-regulatory. Regulatory announcements are those issued by the JSE/NSX, Regulatory Institutions or by Companies that can issues shares but have no listed instruments.
Announcement Group Code	AnnGrpCde	This grouping of codes is used to identify the type of regulatory announcement, e.g. EXCH, JSEO.
Listing Type	LstTyp	Identifies the type of listing on the Exchange, e.g. Primary or Secondary.
Product Code	PrdCde	The Product Code is used to identify the news product and audience that the content is destined for, e.g. JSE SENS Real Time.

6.3.2 JSE Controlled Vocabularies NOT Published in SENS Knowledge Item

Table 3 lists the CVs which *are* owned by the JSE, however due to their high update volatility or size, are *not* published as a controlled vocabulary in KnowledgeItem format; instead, they are provided through the JSE's InfoMax end-of-day data products service.

The JSE InfoMax products below are *not* mandatory or required to successfully process the JSE NewsML messages, however provide additional metadata on the announcements.

Please contact the JSE Information Services Division should you require further information on the JSE InfoMax products or visit website:
https://www.jse.co.za/services/market-data/market-announcements

Table 3 – JSE Controlled Vocabularies NOT published in the SENS Knowledge Item

Controlled Vocabulary	Description
Organisation Identification	**Alias:** OrgId **Description of this CV by the owner:** Each company or organisation which is authorised to issue news is assigned a unique number in the JSE Reference Data System. **InfoMax Product:** Record Type YC Sub Type 01
TIDM – Tradable Instrument Display Mnemonic	**Alias:** TIDM **Description of this CV by the owner:** Each instrument listed on the JSE/NSX is issued with a Tradable Instrument Display Mnemonic (TIDM) by the JSE/NSX. **InfoMax Product:** Record Type DE/DEE Sub Type 05
Instrument Numeric Code	**Alias:** InsNumCde **Description of this CV by the owner:** Each instrument listed on the JSE/NSX is issued a unique Instrument Numeric Code by the JSE. **InfoMax Product**: Record Type DE/DEE Sub Type 05
Organisation Alphanumeric Code	**Alias:** OrgAlphaCde **Description of this CV by the owner:** Each company or organisation which can issue news announcements via SENS is assigned a unique alpha code identifier by the JSE Reference Data System. InfoMax Product: Record Type YC Sub Type 01
Instrument Alphanumeric Code	**Alias:** InsAlphaCde **Description of this CV by the owner:** Each instrument is assigned a unique alpha code identifier by the JSE Reference Data System. **InfoMax Products:** Record Type EQ/EQE Sub Type 01 Record Type EN/ENE Sub Type 01 Sequence 01-02 Record Type EN/ENE Sub Type 02 Sequence 01 and 02 Record Type EC/ECE Sub Type 01

ISIN – International Securities Identifying Number
 	
ISO 6166:2001
	Alias: isin
	
	Body owning this CV: Not a single body, but the specifications of the ISIN the NSINs (National Securities Identifying Number) are assigned by a local national body for each country.
	
	Description of this CV by the owner: International Securities Identifying Number.
	
	Homepages for CV: http://www.isin.org/
	                             http://www.iso.org (ISO/DIS 6166)
	                             http://cvx.iptc.org/isin/
	
	The ISINs for JSE/NSX listed instruments is available from the following JSE InfoMax products:
	
	Record Type DE/DEE Sub Type 07
	Record Type DR/DRE Sub Type 01
	Record Type EN/ENE Sub Type 01 Sequence 01-02
	Record Type ES/ESE Sub Type 01
	
	Or from the following JSE web page:
	https://www.jse.co.za/services/market-data/isin-data
	
	NB: The ISIN scheme is already provided in the IPTC Catalog and is therefore not repeated in the JSE Catalog.

6.3.3 Schemes from other issuing authorities in other formats

In addition to the above JSE-managed CVs, JSE NewsML also uses the CVs in Table 4 maintained by other issuing authorities:

Table 4 – External Controlled Vocabularies in other formats

Controlled Vocabulary	Description
ISO 2-letter Country Name Codes	**Alias:** iso3166-1a2 **Body owning this CV**: ISO - International Organisation for Standardisation - www.iso.ch **Description of this CV by the owner**: Codes for the representation of names of countries and their subdivisions **Homepage for this CV**: http://www.iso.org/iso/country_codes/iso_3166_code_lists.htm and http://cvx.iptc.org/iso3166-1a2/
ICB Sector Codes	**Alias:** ICBSubSec **Body owning this CV**: Dow Jones http://www.djindexes.com/ and FTSE http://www.ftse.com/ **Description of this CV by the owner:** Classification system called the Industry Classification Benchmark (ICB) covering securities worldwide from the Dow Jones and FTSE Universes. This classification system is used to classify JSE/NSX listed instruments. **Homepage for this CV**: http://www.icbenchmark.com/ **The Sector Information for JSE/NSX is also available from the following InfoMax Products:** Record type SN/SNE sub type 01 Record type SN/SNE sub type 02 Record Type EN/ENE Sub Type 01 Sequence 01-02
Market Identification Codes (MIC)	**Alias:** MIC **Body owning this CV**: ISO http://www.iso.org/ **Description of this CV by the owner:** This International Standard (ISO 10383) specifies a universal method of identifying exchanges, trading platforms and regulated or non-regulated markets as sources of prices and related information in order to facilitate automated processing. **Homepage for this CV**: https://www.iso20022.org/10383/iso-10383-market-identifier-codes

6.4 Rights Information

A NewsML rights information include only the usageTerms:

```
<rightsInfo>
  <usageTerms>Usage Terms(...)</usageTerms>
</rightsInfo>
```

6.5 Item Management Metadata

6.5.1 Management Metadata

Table 5 below lists the elements under Management Metadata and indicates which elements are used in JSE NewsML NewsItems:

Table 5 – Item Management Group Elements

Element Title	Element Name	Cardinality	Used in JSE NewsML
Item Class	itemClass	(1)	YES
Content Provider	provider	(1)	YES
Date Item Version Created	versionCreated	(1)	YES
Date Item First Created	firstCreated	(0..1)	YES
Date Item Embargo Ends	embargoed	(0..1)	YES
Publish Status	pubStatus	(0..1)	YES
Role in the Workflow	role	(0..1)	NO
File Name	filename	(0..1)	YES
Generator Tool	generator	(0..1)	YES
Profile	profile	(0..1)	NO
Editorial Service	service	(0..unbounded)	YES
Item Title	Title	(0..unbounded)	NO
Editorial Note	edNote	(0..unbounded)	NO
Member Of	memberOf	(0..unbounded)	NO
Instance Of	instanceOf	(0..unbounded)	NO
Signal	signal	(0..unbounded)	YES
Alternative Representation	altRep	(0..unbounded)	NO
Deliverable Of	deliverableOf	(0..1)	NO
Hash Value	hash	(0..unbounded)	NO

The **itemClass** element indicates the nature of the Item. This element gives a hint on the nature of the Item. IPTC values for NewsItems correspond to the media type of the original content component, i.e. "text", "photo", etc. This is a **mandatory** field. In JSE NewsML, an Item is considered 'composite' if it makes reference the PDF announcement as used for all intraday NewsItems, e.g.:

```
<itemClass qcode="ninat:composite" />
```

The **provider** element is used to denote the party responsible for the management and the release of the Item. The JSE is deemed the provider of all announcements. The JSE company long name is used as a *literal* value to identify the provider, e.g.:

```
<provider literal="JSE Ltd"/>
```

The **versionCreated** element is used to indicate the date and time when the item was created. This is a **mandatory** field, e.g.:

```
<versionCreated>2011-12-28T15:12:38.763Z</versionCreated>
```

NB: All item and content timestamps use an ISO 8601 [36] [37] UTC [185] Zulu [186] timestamp of the format:

```
<YYYY>"–" <MM> "–" <DD> "T" <hh> ":" <mm> ":" <ss> ["."<SSS> ] "Z"
```

The **firstCreated** element is used to indicate the date and time when the item was first created, e.g.:

```
<firstCreated>2011-12-28T15:12:38.763Z</firstCreated>
```

The **embargoed** element indicates the date and time (with the time zone) before which all versions of the Item are embargoed. An embargoed item relates to information that has been released to the JSE in advance so that it may complete any work needed to make it ready for dissemination to the market. The submitters can submit embargoed stories to SENS and therefore JSE NewsML uses this field to reflect the actual Announcement Release Date and Time, e.g.:

```
<embargoed>2011-12-28T15:12:00.000Z</embargoed>
```

The **pubStatus** element indicates the publishing status of the Item. If no value is provided, the default value is "usable". The IPTC makes these values normative for the exchange of Items between a provider and its customers:

- **Usable**: The Item MAY be published without restriction.

- **Withheld**: Until further notice, the Item MUST NOT be published or used under any circumstances. If the Item has been published the publisher MUST take immediate action to withdraw or retract it.

- **Canceled**: The Item MUST NOT be published or used under any circumstances. If the Item has been published the publisher MUST take immediate action to withdraw or retract it.

SENS publishes NewsItems with a 'Usable' or 'Canceled' (note US spelling) status. The 'Withheld' status is not currently used, e.g.:

```
<pubStatus qcode="stat:usable"/>
```

The **filename** element gives the recommended file name for the Item. This element is used in JSE NewsML using the format:

{ServiceID}_{PublicationDate}_{AnnRefNo}_{ItemType}.xml

The ServiceID indicates whether the announcement was published by SENS or NENS; the PublicationDate indicates when the NewsItem was published; the AnnRefNo uniquely identifies the announcement; the ItemType has the value "ITNI" for JSE SENS Real Time NewsItems;, e.g.:

```
<fileName>SENS_20111221_S300428_ITNI.XML</fileName>
```

The **generator** element provides the name and version of the software tool used to generate the Item. In JSE NewsML, the DLL assembly name and version is used e.g.:

```
<generator versioninfo="1.0.0.0">JSE.IS.Sens.NewsML</generator>
```

The **service** element values are defined by each provider, and are often associated with the notion of a desk or a feed. This element is used in JSE NewsML to indicate whether the news is for a SENS/NENS or End-of-Day (InfoMax) service, e.g.:

```
<service qcode="SrvTyp:SENS"/>
```

The **signal** element is used to provide an instruction to the processor of this item that the content requires special handling. Users should be alerted of the reception of an Item containing a signal by some UI mechanism (sound or display). This element is used in JSE NewsML to indicate corrections to announcements. Two types of corrections can be made:

Cancellations and Replacements. In a NewsItem, a Replacement is always preceded by a Cancellation announcement. An Announcement Correction CV is used with this element to allow processors to handle corrections in the appropriate manner:

For a *cancellation* announcement:

```
<signal qcode="CorTyp:Repl"/>
```

For a *replacement* announcement:

```
<signal qcode="CorTyp:Cncl"/>
```

Please see section 6.8 for more information on how NewsItem corrections are handled in JSE NewsML.

6.6 News Content Metadata

The Content Metadata contains information directly associated with the content of the G2 item and is notionally divided into two groups:

- **Administrative Metadata** – information such as the source of the information and the urgency;

- **Descriptive Metadata** – information about the subject matter of the G2 item, such as category and headline.

6.6.1 Administrative Metadata

Table 6 below lists the elements under Administrative Metadata and indicates which elements are used in JSE NewsML NewsItems:

Table 6 – Administrative Metadata Group Element

Element Title	Element Name	Cardinality	Used in JSE NewsML
Urgency	**urgency**	(0..1)	YES
Date Content Created	**contentCreated**	(0..1)	YES
Date Content Modified	contentModified	(0..1)	NO
Located	**located**	(0..unbounded)	YES
Information Source	**infoSource**	(0..unbounded)	YES
Creator	**creator**	(0..unbounded)	YES
Contributor	contributor	(0..unbounded)	NO
Audience	**audience**	(0..unbounded)	YES
Excluded Audience	exclAudience	(0..unbounded)	NO
Alternative Identifier	**altId**	(0..unbounded)	YES

The **urgency** element reflects the editorial urgency of the content. A value of 1 corresponds to the highest urgency; a value of 9 to the lowest. A value of "1" is used for all announcements which have been marked as "Price Sensitive" by the submitter. A value of "4" is used for "Non Price-sensitive" announcements, e.g.:

```
<urgency>1</urgency>
```

The **contentCreated** element refers to the date (and optionally the time with the time zone) at which the content was *first* created. This date (and time) may also be different from the date (and time) of the creation of an Item holding the content. For JSE NewsML, this time refers to the datetime stamp (in UTC) of the announcement submitted by the news provider, e.g.:

```
<contentCreated>2011-12-28T15:10:30.450Z</contentCreated>
```

The **located** element refers to the location from which the content originates. This information applies especially to news, and may also be expressed as free text in the *dateline* of a story, along with a date of content creation and the name of the content provider. The rules for determining the location are provider dependent. For SENS announcements, the location is always set to a literal value of "Johannesburg". This applies to both JSE and NSX announcements, e.g.:

```
<located literal="Johannesburg"/>
```

The **infoSource** element describes a party (person or organisation) which originated some information used to create or enhance the content. In a NewsItem, the infoSource is the announcement's Primary Company/ Organisation (RelNat:hasRelSeq literal='1') and not any intermediary such as Designated Advisors or Sponsors. The infoSource is identified through the Organisation Identifier scheme. Additional infoSource metadata is provided in an **assert** with the same QCode, e.g.:

```
<infoSource qcode="OrgId:1207" />
```

The **creator** element defines the party (person or organisation) which created the resource. In a NewsItem, the creator is the announcement's Primary Company/ Organisation (RelNat:hasRelSeq literal='1') and not any intermediary such as Designated Advisors or Sponsors. The creator is identified through the Organisation Identifier scheme. Additional creator metadata is provided in an **assert** with the same QCode, e.g.:

```
<creator qcode="OrgId:1207" />
```

The **audience** element is used to indicate the intended audience for the content. In JSE NewsML it is used to indicate which client base based on news Product Code the particular is intended for, e.g.:

```
<audience qcode="PrdCde:ITNI" />
```

The **altId** element is an alternative identifier allocated to the content. If there is more than one alternative identifier, they should be qualified using the *type* qualifier to distinguish between different identification schemes. This element is used to represent the Announcement Number generated by SENS (e.g. 201112090001A) or the new Announcement Reference Number (e.g. S1). It is also used in announcement corrections to provide a Previous Announcement Number (e.g. 201112090001A). These Identifiers are alternatives to the NewsItem GUID. A scheme for the alternative identifiers is provided under the alias of *AltIdTyp, e.g.:*

```
<altId type="AltIdTyp:AnnNo">201112280004A</altId>
<altId type="AltIdTyp:AnnRefNo">S300428</altId>
```

6.6.2   **Descriptive Metadata**

Table 7 below lists the elements under Descriptive Metadata and indicates which elements are used in JSE NewsML NewsItems:

Table 7 – Descriptive Metadata Group Element

Element Title	Element Name	Cardinality	Used in JSE NewsML
Language	**Language**	(0..unbounded)	YES
Genre	**Genre**	(0..unbounded)	YES
Keyword	Keyword	(0..unbounded)	NO
Subject	**Subject**	(0..unbounded)	YES
Slugline	Slugline	(0..unbounded)	NO
Headline	**Headline**	(0..unbounded)	YES
Dateline	Dateline	(0..unbounded)	NO
By	By	(0..unbounded)	NO
Credit Line	Creditline	(0..unbounded)	NO
Description	Description	(0..unbounded)	NO

The **language** element describes the language associated with the content. The language is identified in the @tag attribute with values that must conform to the IETF's BCP47. For JSE NewsML the default language is English unless locally overridden:

```
<language tag="en"/>
```

The **genre** element indicates the nature, intellectual or journalistic form of the news content. This element is used to reflect the SENS concept of Release Type such as Formal Release or Press Release. A controlled vocabulary is used to define the release types:

```
<genre qcode="RelTyp:100" />
```

The **headline** element gives a brief introduction to the news content. In JSE NewsML, the announcement headline is limited to 150 characters. e.g.:

```
<headline>Director Dealing In Securities(...)</headline>
```

The **subject** element indicates an important topic of the content - what the content is about. JSE NewsML NewsItems use the *subject* element to surface the following aspects of announcements as metadata selected by the news submitter:

- Announcement Types and Subtypes;
- Companies or organisations; and
- Companies' tradable instruments (if applicable).

Subject: Announcement Types and Subtypes

The announcement type and subtype provide important information about the nature of the announcement. An announcement must have at least one announcement type.

The Announcement Types and Subtypes are made available to subscribers as part of the SENS KnowledgeItem discussed in Section 9. The submitter can select **one or more** Announcement Types per news message. Each announcement type can have **zero or many** announcement subtypes, e.g.:

```
<subject qcode="AnnTyp:123">
    <name>Dealings</name>
    <narrower qcode="AnnSubTyp:125">
      <name>by Director</name>
    </narrower>
</subject>
```

If an Announcement Type has an associated Announcement Subtype, this is indicated by **narrower** relation. If more than one subtype is used, then narrower relations are included for

each subtype. Both the subject and narrower relations include a **name** for the announcement type/subtype.

Subject: Companies

The subject has the additional function in JSE NewsML NewsItems of identifying the companies selected by the announcement submitter, e.g.:

```
<subject qcode="OrgId:1207" />
```

Please refer to table in Section 6.3.2 for details on resolving the Organisation Identifier scheme (alias=OrgId).

Additional metadata for the company or organisation is provided in an **assert** after the contentMeta section with the same QCode.

NB: The company or companies selected by the announcement submitter are always included as a <u>subject</u> of the announcement. However, the company or companies <u>may or may not be</u> the actual subject of the announcement but have an unspecified relationship to the announcement. The interpretation of the company relationships to the announcement is left to the news reader based on the actual news content and related metadata such as announcement type.

Subject: Instruments

The subject is also used to provide the list of instruments (if applicable) selected by the announcement submitter, e.g.:

```
<subject qcode="InsNumCde:193" />
```

Please refer to table in Section 6.3.2 for details on resolving the Instrument Numeric Code scheme (alias=InsNumCde).

Additional metadata for the instrument(s) is provided in an **assert** after the contentMeta section using the same QCode(s).

NB: If tradable instrument are selected by the announcement submitter, they are always included as a <u>subject</u> of the announcement. However, the instrument <u>may or may not be</u> the subject of the announcement but have an unspecified relationship to the announcement. The interpretation of the instrument(s) relationships to the announcement is left to the news reader based on the actual news content and related metadata such as announcement type.

Additional metadata provided via Assertions

A company or organisation is related to other concepts within JSE NewsML; these relationships are defined by the **related** element using a *Subject-Predicate-Object* triple to relate subjects to objects:

For example, a relationship such as: "*Investec Limited is registered in South Africa*" is mapped as follows:

Subject   : Investec Limited
Predicate   : is registered in
Object   : South Africa

In JSE NewsML, the above triple would look as follows:

```
<assert qcode="OrgId: 1207">
  <related rel="RelNat:isRegisteredIn" qcode="iso3166-1a2:ZA"/>
</assert>
```

Where:

Subject	: OrgId:1207
Predicate	: RelNat:isRegisteredIn
Object	: iso3166-1a2:ZA

The predicate rel="alias:value" is distinct from the linguistic notion of 'predicate' and is only a mnemonic placeholder for the predicate. The actual "name" in the RelNat scheme in the SENS KnowledgeItem provides the linguistic equivalent, e.g. "is registered in".

Assertions on Companies or Organisations

The following code snippet shows how the NewsML **assert** is used to provide additional information about the companies or organisations identified as a **subject** of the announcement or elsewhere in the NewsItem such **infoSource** and **creator**:

```
<assert qcode="OrgId:1207">
  <related rel="RelNat:hasRelSeq" literal="1" />
  <related rel="RelNat:hasRole" qcode="AnnRol:ISSE" />
  <related rel="RelNat:hasRoleOn" qcode="MIC:XJSE" />
  <related rel="RelNat:isRegisteredIn" qcode="iso3166-1a2:ZA" />
  <sameAs qcode="OrgAlphaCde:INL" />
  <name role="nrol:short">INVLTD</name>
  <name role="nrol:full">INVESTEC LIMITED</name>
</assert>
```

The company or organisation which is identified by the 'OrgID=value' is then associated with several other concepts via a *Predicate* using the **related** element as follows:

- The RelNat:hasRelSeq *predicate* indicates whether the company is the Primary Company (literal="1") or whether it is a Related Company. The Primary Company is deemed the submitter of the announcement. The Relationship sequence is provided by the literal value, e.g. Related Company 1 would have a literal="2". The scheme for announcement relationship sequences is not provided as the number related companies is theoretically unbounded.

- The RelNat:hasRole *predicate* indicates what role the company plays in the announcement, e.g. Equity Issuer, Warrant Issuer, etc.

- The RelNat:hasRoleOn *predicate* indicates the Exchange (XJSE or XNAM using MIC codes) where the company or organisation has the stated role described above.

- The RelNat:isRegisteredIn *predicate* indicates the country of registration of the company or organisation.

The company or organisation is alternatively identified via the Organisation Alphanumeric Code ('OrgAlphaCode:value') using the **sameAs** element.

NB: The Company Alpha Code may contain white spaces (blanks). White spaces are not allowed in QCodes. Please see Section 13.8.2 of *IPTC-G2-Implementation Guide 4* for additional information on handling white spaces in QCodes. The JSE uses "__" (double underscore - ASCII 242) as the escape character for white space in QCodes.

The company *short name* and *full name* are provided by the **name** element using the @role attribute.

Assertion of Listed Tradable Instruments

Finally, the **assert** element is used in JSE NewsML NewsItems to provide information about the instruments selected by the announcement submitter, e.g.:

```
<assert qcode="InsNumCde:193">
  <related rel="RelNat:hasRelSeq" literal="1" />
  <related rel="RelNat:isIssuedBy" qcode="OrgId:1207" />
  <related rel="RelNat:isIssuedIn" qcode="iso3166-1a2:ZA" />
  <related rel="RelNat:hasListingType" qcode="LstTyp:Primary" />
  <related rel="RelNat:isListedOn" qcode="MIC:XJSE" />
  <related rel="RelNat:isListedOn" qcode="MktTyp:EM" />
  <related rel="RelNat:isListedOn" qcode="BrdTyp:Main" />
  <related rel="RelNat:hasSubSector" qcode="ICBSubSec:8777" />
  <sameAs qcode="isin:ZAE000081949" />
  <sameAs qcode="TIDM:101G" />
  <sameAs qcode="InsAlphaCde:INL" />
  <name role="nrol:short">INVLTD</name>
  <name role="nrol:full">Investec Ltd</name>
</assert>
```

The instrument is primarily identified by a QCode using the Instrument Numeric Code (InsNumCde:value) maintained in the JSE master data system but alternative identifiers such as ISIN, TIDM and Instrument Alphanumeric Code are provided via the **sameAs** element.

The Instrument Announcement Relationship Sequence Number, rel="RelNat:hasRelSeq" is used to identify the Primary Instrument (literal="1") and related instruments for the particular company (Issuer), e.g. Related Instrument 1 (literal="2").

The Company which has issued the instrument is given by the **related** element rel="RelNat:isIssuedBy" and QCode (OrgId:value).

The Country where the instrument was issued in is given by the **related** element rel="RelNat:isIssuedIn" and QCode (iso3166-1a2:value).

The Listing Type of the instrument (e.g. Primary or Secondary listing) is given by the **related** element rel="RelNat:hasListingType" and QCode (LstType:value)

The Exchange where the specific instrument is listed in is given by the **related** element rel="RelNat:isListedOn" and QCode (MIC:value).

The Market (e.g. equity market, derivatives market) where the instrument is listed on is given by the **related** element rel="RelNat:isListedOn" and QCode (MktTyp:value).

The Board where the instrument is listed on is given by the **related** element rel="RelNat:isListedOn" and QCode (BrdTyp:value)

The ICB (Industry Classification Benchmark) subsector under which the instrument is classified in is given by the **related** element rel="RelNat:hasSubSector" and QCode (ICBSubSec:value).

The **sameAs** element is used to provide the following alternative identifiers for an instrument using JSE reference data:

- International Securities Identification Number (ISIN);
- Future-date ISIN with date from which ISIN will come into effect (optional);
- Tradable Instrument Display Mnemonic (TIDM);

- Instrument Alpha code;

The ISINs can be future-dated and hence the *validfrom* attribute is used to indicate the *effective from* date.

The TIDM is optional for some instrument types. For these instruments the *sameAs* for the TIMD is *not* used.

The Instrument Alpha Code may contain white spaces (blanks). White spaces are not allowed in QCodes. Please see Section 13.8.2 of *IPTC-G2-Implementation Guide 4* for additional information on handling white spaces in QCodes. The JSE uses "__" (double underscore – ASCII 242) as the escape character for white space in QCodes.

The instrument *short name* and *full/long name* are provided by the **name** element using the @role qualifier.

6.6.3   **Provider-specific Content Metadata**

Each news provider may add a set of metadata properties which have to be defined in a non-IPTC-G2 namespace. JSE NewsML has introduced a few metadata elements to deal with the unique requirements of SENS.

The SENS metadata additions are validated against a JSE-provided XSD Schema. This schema is identified by the following namespace:

```
xmlns:sens=http://JSE/Schemas/SENS/NewsML/Extensions/
```

The SENS Extensions XSD file is available from the following JSE website link:
https://www.jse.co.za/services/technologies/equity-market-trading-and-information-technology-change
See section "JSE NewsML Extensions" on the webpage above.

The following extension properties for Content Metadata are added:

The **AnnouncementGroupCode** element is used for regulatory announcements. Please see Section 6.3 for additional information on how the field is populated based on the type of regulatory announcement. If the announcement is non-regulatory this field will not be present in the NewsML, e.g.:

```
<sens:AnnouncementGroupCode qcode="AnnGrpCde:EXCH"/>
```

The **PriceSensitivityIndicator** element is used to provide an indication by the submitter as to whether the announcement may have an impact on the price of any listed instrument selected by the submitter, e.g.:

```
<sens:PriceSensitivityIndicator qcode="PrcSenInd:Y"/>
```

The **AnnouncementRegulatoryCode** element is used to indicate whether the announcement is of a regulatory or non-regulatory nature, e.g.:

```
<sens:AnnouncementRegulatoryCode qcode="AnnRegCde:N"/>
```

*Note: The SENS Extension Schema has re-used the **QCode** attribute for elements using the same specifications as standard NewsML-G2 **alias:value**.*

6.7 NewsItem Content for JSE SENS Real Time

6.7.1 Inline content: Plain text

In JSE NewsML, the news content for JSE SENS Real Time consists of Windows-1252 encoded text. It is included as an inlineData payload.

```
<inlineData contenttype="text/plain"
    xml:space="preserve">Announcement plain-text in Windows-1252
</inlineData>
```

Please note the following when processing the text payload above:

1) The inline text is conforms to Windows 1252 character set;

2) Whitespace being must be preserved;

3) Non-XML characters are XML-escaped;

4) XML processers may normalise carriage return and line feeds (CR + LF) to linefeeds (LF). Some text viewers or operating systems require both the CR and LF to display the text correctly. In this case, the CR may need to be added by processing systems to ensure the text is displayed correctly;

5) In some text viewers, keeping 'word wrap' ON may cause text format to be displayed incorrectly. It is recommended that 'word wrap' be turned OFF to ensure correct formatting;

6) It is recommended that monospaced fonts such as Courier be used to ensure correct formatting;

7) The text width is NOT fixed; display systems need to cater for horizontal scrolling;

8) Intermediate conversion or encodings outside of Windows-1252 *should not* be done as this may corrupt the text, e.g. converting text to UTF-8 and the back to Windows-1252 may not always yield the correct results.

6.7.2 Remote content: PDF file

The JSE SENS Real Time NewsML will have a link to the PDF version of the announcement hosted on the JSE FTP site (Information Delivery Portal - IDP). Users will need to log on to the IDP using the credentials provided by the JSE in order to download the files.

Different IP addresses are to connect to IDP depending on the protocol used (e.g. FTP, FTPS, HTTPS). Please refer the IDP User Connectivity Document more details.

The appropriate IP address must be added to path in *href* of the *remoteContent* to build the full path to the file in IDP:

In SENS, when announcement of type Financial Results is submitted, the location of the detailed financial results will be included in the contentSet as a link, following a semicolon.

```
<remoteContent contenttype="application/pdf" size="130187"
href="\Common\DDAP.SPRD.SENS.STORIES\SENS_20111228_S300425.pdf;https://senspdf.js
e.co.za/cts/2019/jse/isse/att/nam.pdf" />
```

6.8 NewsItem Corrections

In SENS, a NewsItem is corrected by creating a 'Cancellation' and 'Replacement' announcement messages. A 'Cancellation' message always precedes a 'Replacement' message. Only one announcement can be corrected at a time. Corrections can be done against announcements made anytime in the past.

The following NewsML show how the relevant elements and attributes to corrections are used:

6.8.1 Normal Announcement

```
<newsItem urn:newsml:jse.co.za:2011-12-28:SENS:S300425:ITNI"version="1"
...
   <itemMeta>
   ...
  <versionCreated>2011-12-28T15:02:41.140Z</versionCreated>
            <firstCreated>2011-12-28T15:02:41.140Z</firstCreated>
            <pubStatus qcode="stat:usable"/>
    ...
    </itemMeta>
    <contentMeta>
    ...
            <altId type="AltIdTyp:AnnNo">201112280001A</altId>
            <altId type="AltIdTyp:AnnRefNo">S300425</altId>

    ...
    </contentMeta>
...
 </newsItem>
```

6.8.2 Cancellation Announcement

```
<newsItem guid=" urn:newsml:jse.co.za:2011-12-28:SENS:S300427:ITNI"
                version="1"
 ...
   <itemMeta>
   ...
          <versionCreated>2011-12-28T15:12:21.850Z</versionCreated>
            <firstCreated>2011-12-28T15:12:21.850Z</firstCreated>
            <pubStatus qcode="stat:canceled"/>
   <signal qcode="CorTyp:Cncl"/>
    <link contenttype="application/vnd.iptc.g2.newsitem+xml"
        rel="irel:previousVersion"
        residref="urn:newsml:jse.co.za:2011-12-28:SENS:S300425:ITNI ">
      <altId type="AltIdTyp:AnnRefNo">S300425</altId>
      <altId type="AltIdTyp:AnnNo">201112280001A</altId>
   </link>
   ...
    </itemMeta>
    <contentMeta>
    ...
            <altId type="AltIdTyp:AnnNo">201112280003A</altId>
            <altId type="AltIdTyp:AnnRefNo">S300427</altId>

    ...
    </contentMeta>
 ...
 </newsItem>
```

A new GUID with version 1 is used for cancellations – this is using the design pattern to cater for content systems which not support duplicate GUIDs. The Publication Status is changed to 'canceled' (Note that this term from the IPTC CV uses the US spelling). The Announcement Correction Type is provided via the **signal** element with a value of 'Cncl' (Cancelled). Additional Alternative Identifiers, Announcement Number (201112280001A) and Announcement Reference Number (S300425) for the original message are included in the **link**. The Alternative Identifiers in **contentMeta** reflect the New Message. The versionCreated and firstCreated reflect the timestamps for the cancellation message. The cancellation message is a new message and therefore it has new Announcement Numbers and Announcement Reference Numbers.

6.8.3 Replacement Announcement

```xml
<newsItem guid="urn:newsml:jse.co.za:2011-12-28:SENS:S300428:ITNI"
          version="1"
...
  <itemMeta>
...
        <versionCreated>2011-12-28T15:12:38.763Z</versionCreated>
          <firstCreated>2011-12-28T15:12:38.763Z</firstCreated>
          <pubStatus qcode="stat:usable"/>
        <signal qcode="CorTyp:Repl"/>
    <link contenttype="application/vnd.iptc.g2.newsitem+xml"
      rel="irel:previousVersion"
      residref="urn:newsml:jse.co.za:2011-12-28:SENS:S300425:ITNI">
      <altId type="AltIdTyp:AnnRefNo">S300425</altId>
      <altId type="AltIdTyp:AnnNo">201112280001A</altId>
    </link>
...
    </itemMeta>
    <contentMeta>
...
          <altId type="AltIdTyp:AnnNo">201112280004A</altId>
          <altId type="AltIdTyp:AnnRefNo">S300428</altId>
...
    </contentMeta>
...
  </newsItem>
```

A new message is created with a new GUID and version 1. The Publication Status is 'usable'. A **link** points to the original message is included. The Alternative Identifiers in contentMeta reflect the new Announcement Number and Announcement Reference Numbers.

7   MANAGING CONCEPTS – KNOWLEDGEITEM

A KnowledgeItem is used for collating a set of concept definitions to form the physical representation of a controlled vocabulary.

Listing 2 shows a sample of the SENS knowledgeItem containing only two schemes. Please see Section 8.2 for a more information on how to obtain the full SENS KnowledgeItem.

Listing 2 – Sample KnowledgeItem

```xml
<?xml version="1.0" encoding="Windows-1252"?>
<knowledgeItem guid="urn:newsml:jse.co.za:20111220:SENS:KI"
              version="27"
              xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
              conformance="power"
              standard="NewsML-G2"
              standardversion="2.9"
              xml:lang="en"
              xmlns="http://iptc.org/std/nar/2006-10-01/">
  <catalogRef href="http://www.jse.co.za/is/sens/newsml/catalog/JSE_NewsML_Catalog_1.xml" />
  <catalogRef href="http://www.iptc.org/std/catalog/catalog.IPTC-G2-Standards_17.xml" />
  <rightsInfo>
    <copyrightHolder literal="JSE Limited" />
    <copyrightNotice>Copyright 2011 JSE Limited. All rights reserved.</copyrightNotice>
    <usageTerms>SENS usage terms (...)</usageTerms>
  </rightsInfo>
<itemMeta>
    <itemClass qcode="cinat:concept" />
    <provider literal="JSE Limited" />
    <versionCreated>2011-12-20T14:54:47.841Z</versionCreated>
    <firstCreated>2011-12-20T14:54:47.841Z</firstCreated>
    <pubStatus qcode="stat:usable" />
    <fileName>ncdki-sens.xml</fileName>
    <title>Knowledge Item for SENS and NENS.</title>
```

```xml
    </itemMeta>
    <contentMeta>
      <contentCreated>2011-12-20T14:54:47.841Z</contentCreated>
      <infoSource literal="JSE Limited" />
      <creator literal="JSE Limited" />
      <language tag="en" />
    </contentMeta>
    <conceptSet>
      <!--Alternative Identifier-->
      <concept id="AltIdTypAnnRefNo">
        <conceptId qcode="AltIdTyp:AnnRefNo" created="2011-12-08T08:00:00.000Z"/>
        <type qcode="cpnat:abstract"/>
        <name validfrom="2011-12-08T08:00:00.000Z" validto="2011-12-09T08:00:00.000Z">
          Announcement Reference Number- OLD
        </name>
        <name validfrom="2011-12-09T08:00:00.000Z">
          Announcement Reference Number - NEW
        </name>
        <definition validfrom="2011-12-08T08:00:00.000Z" validto="2011-12-09T08:00:00.000Z">
          Announcement Reference Number Definition - OLD
        </definition>
        <definition validfrom="2011-12-09T08:00:00.000Z">
          Announcement Reference Number Definition - NEW
        </definition>
      </concept>
  <!--Announcement Type -> 100-->
      <concept id="AnnTyp100">
        <conceptId qcode="AnnTyp:100" created="2000-01-01T00:00:00.000Z" />
        <type qcode="cpnat:abstract" />
        <name validfrom="2000-01-01T00:00:00.000Z">Acquisition</name>
        <definition validfrom="2000-01-
01T00:00:00.000Z">A acquisition of assets by an Issuer </definition>
        <narrower qcode="AnnSubTyp:218" validfrom="2000-01-01T00:00:00.000Z" />
        <narrower qcode="AnnSubTyp:223" validfrom="2000-01-01T00:00:00.000Z" />
        <narrower qcode="AnnSubTyp:225" validfrom="2000-01-01T00:00:00.000Z" />
        <narrower qcode="AnnSubTyp:224" validfrom="2000-01-01T00:00:00.000Z" />
      </concept>
  <!--Announcement Sub Type -> 218-->
      <concept id="AnnSubTyp218">
        <conceptId qcode="AnnSubTyp:218" created="2000-01-01T00:00:00.000Z" />
        <type qcode="cpnat:abstract" />
        <name validfrom="2000-01-01T00:00:00.000Z">Category 1</name>
        <definition validfrom="2000-01-01T00:00:00.000Z">
 An acquisition or disposal of assets by an Issuer for a cash consideration which is twenty

percent of the market capitalisation of the company or an issue of shares which forms twenty

      five percent of the issued share capital of the company
        </definition>
        <broader qcode="AnnTyp:100" validfrom="2000-01-01T00:00:00.000Z" />


    </concept>
    </conceptSet>
</knowledgeItem>
```

7.1   KnowledgeItem: Item Management Metadata

The set of Item Management metadata is the same across of G2 items. The following table lists the elements in a JSE NewsML knowledgeItem:

Table 8 – KnowledgeItem Management Metadata

Element Title	Element Name	Cardinality	Used in JSE NewsML
Item Class	itemClass	(1)	YES
Content Provider	provider	(1)	YES
Date Item Version Created	versionCreated	(1)	YES
Date Item First Created	firstCreated	(0..1)	YES
Date Item Embargo Ends	embargoed	(0..1)	NO
Publish Status	pubStatus	(0..1)	YES
Role in the Workflow	role	(0..1)	NO
File Name	filename	(0..1)	YES
Generator Tool	generator	(0..1)	NO
Profile	Profile	(0..1)	NO
Editorial Service	Service	(0..unbounded)	NO
Item Title	Title	(0..unbounded)	YES
Editorial Note	edNote	(0..unbounded)	NO
Member Of	memberOf	(0..unbounded)	NO
Instance Of	instanceOf	(0..unbounded)	NO
Signal	Signal	(0..unbounded)	NO
Alternative Representation	altRep	(0..unbounded)	NO
Item Link	Link	(0..unbounded)	NO

The following items have different usage in the JSE NewsML knowledgeItem compared to a newsItem:

The **itemClass** element is set to "cinat:concept. The **provider** is always set to the JSE's *long name* as maintained in JSE master data. The **firstCreated** element is included as JSE concepts are datetime versioned. A **title** is provided as well.

7.2   KnowledgeItem: Content Metadata

The set of administrative metadata is common to all classes of Items. Please review the corresponding specification for the NewsItem in Section 8.

The following table lists the elements of a Knowledge Item Administrative Metadata and those that are used in JSE NewsML:

Table 9 – KnowledgeItem Administrative Metadata

Element Title	Element Name	Cardinality	Used in JSE NewsML
Urgency	urgency	(0..1)	NO
Date Content Created	contentCreated	(0..1)	YES
Date Content Modified	contentModified	(0..1)	NO
Located	located	(0..unbounded)	NO
Information Source	infoSource	(0..unbounded)	YES
Creator	creator	(0..unbounded)	YES
Contributor	contributor	(0..unbounded)	NO
Audience	audience	(0..unbounded)	NO
Excluded Audience	exclAudience	(0..unbounded)	NO
Alternative Identifier	altId	(0..unbounded)	NO

The following table lists the elements of a KnowledgeItem Descriptive Metadata and those that are used in JSE NewsML:

Table 10 – KnowledgeItem Descriptive Metadata

Element Title	Element Name	Cardinality	Used in JSE NewsML
Language	language	(0...unbounded)	YES
Keyword	keyword	(0...unbounded)	NO
Subject	subject	(0...unbounded)	NO
Description	description	(0...unbounded)	NO

The **contentCreated** element indicates when the concepts were created in JSE master data systems.

The **infoSource** is given a literal value of "JSE Ltd".

The **creator** is given a literal value of "JSE Ltd".

The **language** has the @tag of 'en' as names and definitions are provided by default in English. SENS does not currently provide alternative language names and definitions for concepts.

7.3 KnowledgeItem Content

The schemes maintained by the JSE, as defined in Section 6.3.1, form the content of the SENS knowledgeItem.

A single KnowledgeItem is used for all JSE-owned schemes. This ensures ease of maintenance and distribution to clients. Consumers can determine how to cache the information when processing announcements – for instance, consumers can cache all information or only the subset or schemes of interest.

7.4 Versioning of Concepts

The SENS knowledgeItem concepts are datetime versioned by ensuring the **concept**, **name**, **definition** and concept relationships are time stamped with the **created**, **validfrom** and **validto** attributes.

The **name** and **definition** elements will use the **validfrom** and **validto** attributes to qualify the versions of the elements. When the version of a given concept changes, new entries for **name** and **definition** will be created under the same **conceptId**. If a concept itself is deprecated, then the **retired** attribute will be applied at the **conceptId** level; the concept itself will persist, in order to satisfy archive searches.

The **narrower** and **broader** elements are also used to express *parent-child* relationships between concepts if they exist. The parent-child relationships are themselves datetime versioned by using the **validfrom** and **validto** attributes.

Please note that only relationships between concepts defined in the SENS KnowledgeItem are shown – any potentially relationships between SENS concepts and other concepts from schemes maintained by other issuing authorities are not shown in the SENS KnowledgeItem. The Announcement Types and Subtypes is an example of concepts that use the narrow and broader elements to express parent-child relationships.

*Note: The current version of JSE NewsML does not support the use of **partMeta** with a **contentModified** timestamp to allow concepts to be updated individually as opposed to update the entire knowledgeItem.*

7.5 Creation and Maintenance of SENS KnowledgeItem

Each update to the KnowledgeItem will have a unique GUID and version number combination, e.g.:

```
<knowledgeItem guid="urn:newsml:jse.co.za:20111220:SENS:KI"
               version="27"
```

Subscribers will be notified of changes to the SENS KnowledgeItem or its contents according to existing notification policies.

The SENS KnowledgeItem can be downloaded from the following JSE website link:

https://www.jse.co.za/services/technologies/equity-market-trading-and-information-technology-change
See Section "JSE NewsML Knowledge Item" at the webpage above.

8   APPENDIX A – OPAQUE STRINGS

NB: The following (non-exhaustive) list details the fields which have values that are considered to be opaque strings. These strings may be built deterministically but their 'format' is NOT guaranteed and consumers MUST NOT parse them.

String
@guid
@residref
fileName
altId