Federal NOTAM System (FNS)

Submission System Interface (FNS SysLink)

DRAFT

Guide for Managing NOTAM Using the FNS Web Service Interface

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Revision History

Edition No.	Issue Date	Author	Reason for Change
1.0	August 01, 2010	FNS Team	Initial Version for TLO
2.0	January 15, 2010	FNS Team	Generic Version

1 Introduction

Accurate, timely distribution of aeronautical information is critical to the safety and efficiency of the National Airspace System (NAS). The Federal NOTAM System (FNS) is a component of the NAS, and a centrepiece of the FAA's AIM Modernization plan. In order to accomplish this modernization, the FAA has reached out to stakeholders from different industries to create a modern digital NOTAM system designed to meet current and future customer needs. To partner with organizations with a significant investment in software infrastructure, the FAA has created a web services based system-to-system interface that allows software developers to create tools to submit NOTAMs directly from their software system into the Federal NOTAM System by way of FNS SysLink.

FNS SysLink is a SOAP standards-compliant web service intended for external systems to manage their NOTAMs by submiting the request to the Federal NOTAM System. This is a generic service framework for all NOTAM events supported by the FNS system. Examples are provided throughout the document to help develop the client interface for the service.

The purpose of this document is to describe the FNS SysLink interface and provide the procedure for accessing this service. This document should be used along with the NOTAM scenario analysis document to build the client interface [Reference 3].

2 References

1. 7930.2 Notices to Airmen (US NOTAM Policy). Available at http://www.faa.gov/regulations_policies/orders_notices/air_traffic_orders/
2. Aeronautical Information Exchange Model. Details available at http://www.aixm.aero/public/subsite_homepage/homepage.html
3. Federal NOTAM System Scenarios by Aeronautical Information Management (AIM), FAA. Details available at http://notams.aim.faa.gov/fnsstart/

3 Definitions and Acronyms

Table 1: Definitions and Acronyms

AIXM	Aeronautical Information Exchange Model
ASN	Aeronautical Study Number
ASR	Antenna Structure Registration Number
FAA	Federal Aviation Administration
FCC	Federal Communication Commission
FNS	Federal NOTAM System
ICAO	International Civil Aviation Organization
NAS	National Airspace System
NOTAM	Notice to Airmen
SLA	Service Level Agreement
SOAP	Simple Object Access Protocol
UTC	Coordinated Universal Time
UUID	Universally unique identifier
WSDL	Web Service Definition Language

4 NOTAM Submission Overview

The Federal NOTAM System (FNS) is the next generation platform being developed by the FAA for the collection, management and distribution of NOTAMs. FNS makes available both a user/web interface and a system/web-service interface for NOTAM originators. Using these interfaces, the originators can manage NOTAMs affecting their facility directly without any involvement from third parties. The focus of this document is on the system interface which allows existing software applications to interface with FNS. This is of significant value for organizations with significant investment in software infrastructure. This has the potential of eliminating the need for training their users to a new piece of software, but at the same time enabling them to interface with FNS using a web-service interface that are mostly managed behind the scenes without impact the end-user of the system.

As in the case of the user interface, draft NOTAMs (proto-NOTAM) submitted to FNS by system interface users are also routed through the same workflow including validating the submission against a set of business rules before they are numbered and published into the NAS. Similar to the user interface, the system interface also supports both digital and free text entry of NOTAMs. Digital entry is the preferred method as it allows application of business rules against the various data elements and also the system is capable of transforming the information to various NOTAM formats including the current FAA traditional, ICAO and plain language format. This in effect ensures standardization of the NOTAM and also allows automatic interpretation by the system to produce an accurate view of the aeronautical feature.

In addition to the capability to submit a NOTAM, FNS SysLink can be used to cancel the NOTAM if the purpose of the NOTAM is completed before the specified end-date. Otherwise the NOTAM automatically expires at the given end date. An operation to check the status of the submission is also provided which can be useful in cases where a NOTAM number is not provided immediately (synchronous) as a response to the submission.

FNS implements digital NOTAMs using the concept of scenarios. Scenario refers to a set of properties used to represent the NOTAM event. It also includes the associated business rules, mapping to the AIXM data model and the rules for transformation into the various NOTAM formats. Details on the FNS NOTAM scenarios can be found in the analysis document included in the reference section [Reference 3]. FNS SysLink is a generic interface and can be used for all the scenarios defined in this document. Within this generic framework, a NOTAM scenario is communicated by using the scenario specific AIXM message with the appropriate event elements populated.

4.1 Steps to Using FNS SysLink

The high level steps for using the FNS SysLink to manage NOTAMs are described below. This includes obtaining approval from the FAA AIM Management and also agreeing to the SLA.

- Obtain approval for using FNS SysLink (details provided in section 5).
- Authorization to submit NOTAM on the given facility/feature (Safety Paperwork).
- Develop client software to interface with FNS SysLink system interface.
- Use appropriate scenario and submit AIXM message for the temporary/NOTAM event including the time period in UTC for which the NOTAM is going to be effective.

On successful submission of the NOTAM request, FNS SysLink will respond with the NOTAM number and the text of the NOTAM that will be published in the NAS. In the case where NOTAM number is not available immediately, the status of the NOTAM can be checked regularly to get the updated status on the NOTAM submission.

FNS contains the baseline repository of all the aeronautical features on which NOTAMs are created. This information is used to both validate the NOTAM submissions and also reduce the data input required from the originators. As an example, for obstacles, FNS contains all obstacle data from both the FAA's OE/AAA system and also FCC. In order to create a light outage NOTAM on a tower, FNS can determine the height of the tower, nearest airport and the distance to it just by using the ASN or ASR as input from the originator.

Once published, the NOTAM can be obtained using the FAA NOTAM websites like http://notams.aim.faa.gov/notamSearch and https://pilotweb.nas.faa.gov.

5 Requirements for Submitting

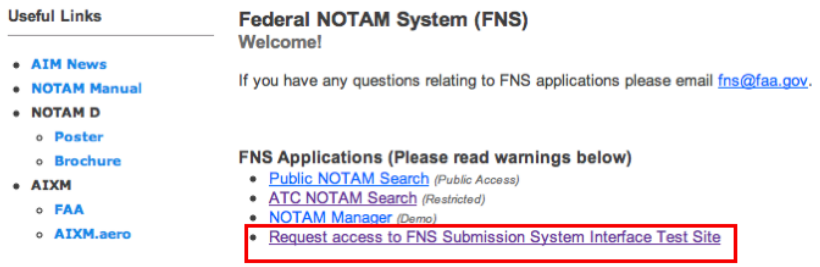
5.1 Authorization to transmit NOTAM requests to the FNS

Only authorized users can use the FNS SysLink to submit NOTAM requests. Authorized users must meet the following conditions:

- Be the owner, operator or have delegated authority for originating NOTAMs on the aeronautical feature.
- Demonstrate web service system interface connectivity.
- Agree to the terms of the FNS SysLink Service Level Agreement with the FAA's Aeronautical Information Management (AIM) group.
- Pass FNS SysLink submitter test plan.

5.1.1 Requesting authorization

Authorization requests can be made by filling out the form (shown below) available at http://notams.aim.faa.gov.



Upon approval, details for registering a user account on the FNS demo site will be provided via email.

5.1.2 Demonstrating web service system interface connectivity

FNS SysLink uses SOAP 1.2 compliant web services. Details of the service can be obtained from the WSDL given below.

http://notamdemo.aim.nas.faa.gov/fnsMessage/services/fnsMessage?wsdl

This is the demo site and access to the prototype field test site will be provided after successful completion of testing.

5.1.3 Agree to the terms of the FNS Service Level Agreement (SLA)

The standard SLA for FNS SysLink is included in Appendix A. The submitter must agree to the terms of the SLA and email a signed copy of the agreement to fns@faa.gov. Any questions related to the SLA can be sent to fns@faa.gov.

5.1.4 Pass FNS Submitter test plan

Access to prototype field test FNS SysLink will be provided after the submitter demonstrates:

- Connectivity to the Demo system.
- Error free parallel submission processes of at least 10 successive NOTAMs.
    - Submission of NOTAMs using standard procedures (submission to Flight Services)
    - Parallel submission to the Demo system.

The FAA reserves the right to terminate access to FNS SysLink if submitter does not comply with the terms of the SLA.

6 Submission System Interface Capabilities

6.1.1 Interface Overview

The FNS SysLink is a SOAP 1.2 compliant web-service interface that provides operations for NOTAM originators to manage their NOTAM submissions. AIXM (Aeronautical Information Exchange Model) 5.1 is the payload for all the interfaces provided. AIXM is the accepted global standard for exchanging aeronautical information. More details on AIXM can be found at http:///www.aixm.aero.

The three main operations provided by FNS SysLink for managing NOTAMs are listed below.

- Submission of NOTAM
- Cancellation of an active NOTAM
- Operation to check status of submission.

The details of these operations are discussed in the following sections.

Table 2: FNS SysLink Operations

Operation	Description
ProcessNOTAM	Main method for managing NOTAMs. Contains three sub-operations to be used for individual action.
ProcessNOTAM.Create_NOTAM	Operation for submitting a NOTAM to FNS for activation and publication.
ProcessNOTAM.Cancel_NOTAM	Operation for submitting a cancellation request to FNS for an existing active NOTAM.
ProcessNOTAM.Check_NOTAM_Status	Operation to check the status of a previous submission to FNS.
RetrieveFeatureInfo	Operation to obtain baseline information about the feature.

6.1.2 Security

Access to all operations supported by FNS SysLink requires a valid user account and password. Requirements for obtaining the user account are provided in section 5 of this document. In addition all data transmission between the client and the FNS servers are encrypted through SSL.

6.1.3 WSDL

The latest WSDL for the FNS SysLink can be found at: http://notamdemo.aim.nas.faa.gov/fnsMessage/services/fnsMessage?wsdl. The WSDL imports two schemas:

- AIXMBasicMessage.xsd
- FNS_Messages.xsd

AIXMBasicMessage.xsd is the message envelop for the AIXM schema. Complete details on AIXM can be found on the AIXM web site http://www.aixm.aero. *FNS_Messages.xsd* is an extension of AIXM 5.1, and is developed to support the requirements of the FNS system for managing NOTAMs (create, cancel and check status).

Using the WSDL, software developers should be able to develop client code containing SOAP requests using tools like Apache CXF to interface with FNS SysLink. This document also provides a listing of the required elements for each operation and their XPATH relative to the SOAP message body. In addition, sample SOAP request and response messages are also included for every operation. FNS follows the scenario/event concept for implementing digital NOTAMs. The scenario analysis document contains the AIXM definition for every scenario.

6.1.4 System Interface Details

6.1.4.1 Directory of Errors & Exceptions

Requests resulting in errors or exceptions will be provided using the “status” and “message” elements of the response message. While the status element categorizes the type of error/exception, the message element will provide details about the underlying issue. The list of error/exception statuses are listed in table 3 below with an example below that.

Table 3: FNS SysLink List of Error/Exceptions

Error/Exception	Description
USER_LOGIN_ERROR	User credentials incorrect. After five incorrect tries, the user account will be locked. Use the FNS web interface to reset the password.
SYSTEM_ERROR	Potential network/hardware error. Contact FNS help desk to help resolve this.
DATA_MISSING_ERROR	The SOAP request is incomplete.
DATA_VALIDATION_ERROR	SOAP request not compliant to the schema.

```
<soap:Envelope xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/">
  <soap:Body>
    <fnsMessage xmlns:ns1="http://www.opengis.net/gml/3.2" xmlns:ns2="http://www.w3.org/1999/xlink"
xmlns:ns3="http://www.isotc211.org/2005/gco" xmlns:ns4="http://www.isotc211.org/2005/gmd"
xmlns:ns5="http://www.aixm.aero/schema/5.1" xmlns:ns6="http://www.isotc211.org/2005/gts"
xmlns:ns7="http://www.faa.gov/aim/fns/1.0" xmlns:ns8="http://www.aixm.aero/schema/5.1/event"
xmlns:ns9="http://www.aixm.aero/schema/5.1/message">
      <ns1:boundedBy xsi:nil="true" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"/>
      <ns7:hasResponse>
        <ns7:NOTAMResponse ns1:id="NotamResponse_1">
          <ns7:status>USER_LOGIN_ERROR</ns7:status>
          <ns7:message>Incorrect user credentials</ns7:message>
        </ns7:NOTAMResponse>
      </ns7:hasResponse>
      <ns7:hasRequest>
        <ns7:NOTAMRequest ns1:id="ID_2">
          <ns7:userID>john.doe@faa.gov</ns7:userID>
          <ns7:password>password</ns7:password>
          <ns7:scenarioType>OBSTRUCTION_TOWER_LIGHTS_OUT_OF_SERVICE</ns7:scenarioType>
          <ns7:requestAction>CREATE_NOTAM</ns7:requestAction>
        </ns7:NOTAMRequest>
      </ns7:hasRequest>
    </fnsMessage>
  </soap:Body>
</soap:Envelope>
```

Figure 1: Sample Error/Exception Response

6.1.4.2 Create NOTAM (ProcessNOTAM.Create_NOTAM)

This operation is used for submitting a NOTAM request to FNS using the SysLink interface. The details of the operation are provided in this section including sample SOAP request and response messages. *Create_NOTAM* is a sub operation of the *ProcessNOTAM* operation.

The hasRequest sub-element in FNSMessage schema is used in the request message for submitting a request for NOTAM creation. As described in earlier sections, FNS uses the scenario concept for the implementation of digital NOTAMs. The name of the scenario (called scenario_type in SysLink) is a required parameter in the Create_NOTAM request message. As an example, for submitting a NOTAM for a light outage on a vertical structure, the scenario_type should be set to *OBSTRUCTION_TOWER_LIGHTS_OUT_OF_SERVICE*. The complete listing of scenarios supported by SysLink is available in Appendix A. Table 6 below provides details on some of the mandatory data elements required for the Create_NOTAM operation.

The affected feature for which NOTAM is being submitted for is identified under the hasMember sub-element in the FNSMessage. Depending on the scenario, the affected feature(s) and the elements required to describe them will differ. More details on this can be found in the scenario analysis document identified in the Reference section.

The response to the Create_NOTAM operation is also an FNSMessage. In the hasResponse element of the FNSMessage, both a status and message element is included. If the request is successfully processed, the hasResponse element will also contain a NOTAM XML element.

Table 6: Required parameters for Create_NOTAM Request

Name	Description	XPATH
Username	FNS user name	/fnsMessage/fns:hasRequest/fns:FNSNotamRequest/fns:userID
Password	Password	/fnsMessage/fns:hasRequest/fns:FNSNotamRequest/fns:password
scenarioType	Scenario name	/fnsMessage/fns:hasRequest/fns:FNSNotamRequest/fns:scenarioType
requestAction	CREATE_NOTAM	/fnsMessage/fns:hasRequest/fns:FNSNotamRequest/fns:requestAction
Start Date	NOTAM Start date-time in UTC	/fnsMessage/fns:hasMember/ aixm:VerticalStructure/ aixm:timeSlice/aixm:VerticalStructureTimeSlice/[interpretation=TEMPDELTA]/gml:validTime/gml:TimePeriod /gml:beginPosition
End Date	NOTAM end date-time in UTC	/fnsMessage/fns:hasMember/ aixm:VerticalStructure/ aixm:timeSlice/aixm:VerticalStructureTimeSlice/[interpretation=TEMPDELTA]/gml:validTime/gml:TimePeriod /gml:endPosition

A sample SOAP message for the Create_NOTAM operation is shown in Figure 2 below. For the example, the scenario for submitting light outage on a tower is used.

```
<soapenv:Envelope xmlns:soapenv="http://schemas.xmlsoap.org/soap/envelope/" xmlns:gml="http://www.opengis.net/gml/3.2"
xmlns:xlink="http://www.w3.org/1999/xlink" xmlns:ns1="http://www.aixm.aero/schema/5.1" xmlns:gmd="http://www.isotc211.org/2005/gmd"
xmlns:gco="http://www.isotc211.org/2005/gco" xmlns:gts="http://www.isotc211.org/2005/gts" xmlns:fns="http://www.faa.gov/aim/fns/1.0">
                    <soapenv:Header/>
                    <soapenv:Body>
                      <fnsMessage>
                        <fns:hasMember xmlns="http://www.aixm.aero/schema/5.1">
                          <VerticalStructure gml:id="VS01">
                            <timeSlice>
                              <VerticalStructureTimeSlice gml:id="VS01_TS01">
                                <gml:validTime>
                                  <gml:TimeInstant gml:id="VS_TS01_TI01">
                                    <gml:timePosition>2010-04-07T09:00:00</gml:timePosition>
                                  </gml:TimeInstant>
                                </gml:validTime>
                                <interpretation>SNAPSHOT</interpretation>
                                <name>2004-AEA-221-NRA</name>
                                <type>TOWER</type>
                              </VerticalStructureTimeSlice>
                            </timeSlice>
                            <timeSlice>
                              <VerticalStructureTimeSlice gml:id="VS02_TS01">
                                <gml:validTime>
                                  <gml:TimePeriod gml:id="VS02_TS01_TP01">
                                    <gml:beginPosition>2010-07-22T09:00:00</gml:beginPosition>
                                    <gml:endPosition>2010-07-23T09:00:00</gml:endPosition>
                                  </gml:TimePeriod>
                                </gml:validTime>
                                <interpretation>TEMPDELTA</interpretation>
                                <lightingAvailability>
                                  <VerticalStructureLightingStatus gml:id="VSLS01">
                                    <status>UNSERVICEABLE</status>
                                  </VerticalStructureLightingStatus>
                                </lightingAvailability>
                              </VerticalStructureTimeSlice>
                            </timeSlice>
                          </VerticalStructure>
                        </fns:hasMember>
                        <fns:hasRequest >
                          <fns:FNSNotamRequest gml:id="ID_2" >
                            <fns:userID>john.doe@faa.gov</fns:userID>
                            <fns:password>password</fns:password>
                                        <fns:scenarioType>OBSTRUCTION_TOWER_LIGHTS_OUT_OF_SERVICE</fns:scenarioType>
                            <fns:requestAction>CREATE_NOTAM</fns:requestAction>
                          </fns:FNSNotamRequest>
                        </fns:hasRequest>
                      </fnsMessage>
                    </soapenv:Body>
                  </soapenv:Envelope>
```

Figure 2: Sample SOAP message for Create_NOTAM operation

The key elements in the response message for Create_NOTAM operation is listed below in Table 7.

Table 7: Response elements for Create_NOTAM Response

Name	Description	Possible values	XPATH location
status	Status of the request	OK ERROR	/fnsMessage/fns:hasRequest/fns:NotamResponse/fns:status
message	Message for processing the request		/fnsMessage/fns:hasRequest/fns:NotamResponse/fns:message
NOTAM	NOTAM element		/fnsMessage/fns:hasRequest/fns:NotamResponse/fns:theFNSNotam

The details of the NOTAM element for successful submissions are detailed in Table 8 below.

Table 8: Details of the NOTAM element contained in Create_NOTAM response

Name	Description	XPATH location
FNS transaction ID	FNS Transaction Id. Can be used to reference the transaction	/fnsMessage/fns:hasRequest/fns:NotamResponse/fns:theFNSNotam/fns:FNSNotam/fns:transactionID
NOTAM accountability	NOTAM Accountability Location	/fnsMessage/fns:hasRequest/fns:NotamResponse/fns:theFNSNotam/fns:FNSNotam/fns:accountability
Affected Location	Affected facility	/fnsMessage/fns:hasRequest/fns:NotamResponse/fns:theFNSNotam/fns:FNSNotam/fns:location
NOTAM ID	NOTAM Number	/fnsMessage/fns:hasRequest/fns:NotamResponse/fns:theFNSNotam/fns:FNSNotam/fns:notamID
NOTAM Status	Status of the NOTAM	/fnsMessage/fns:hasRequest/fns:NotamResponse/fns:theFNSNotam/fns:FNSNotam/fns:status
NOTAM Issued Date	Issue date for the NOTAM	/fnsMessage/fns:hasRequest/fns:NotamResponse/fns:theFNSNotam/fns:FNSNotam/fns:issuedDate
NOTAM Cancelled Date	Cancel date for the NOTAM	/fnsMessage/fns:hasRequest/fns:NotamResponse/fns:theFNSNotam/fns:FNSNotam/fns:cancelledDate
NOTAM US Text	Text in US-FAA format	/fnsMessage/fns:hasRequest/fns:NotamResponse/fns:theFNSNotam/fns:FNSNotam/fns:usNotamText
NOTAM condition Text	NOTAM Condition Text	/fnsMessage/fns:hasRequest/fns:NotamResponse/fns:theFNSNotam/fns:FNSNotam/fns:conditionText

A sample SOAP response message for Create_NOTAM operation is shown in Figure 3 below.

```
<soap:Envelope xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/">
  <soap:Body>
    <fnsMessage xmlns:ns1="http://www.opengis.net/gml/3.2" xmlns:ns2="http://www.w3.org/1999/xlink"
xmlns:ns3="http://www.isotc211.org/2005/gco" xmlns:ns4="http://www.isotc211.org/2005/gmd"
xmlns:ns5="http://www.aixm.aero/schema/5.1" xmlns:ns6="http://www.isotc211.org/2005/gts"
xmlns:ns7="http://www.aixm.aero/schema/5.1/event" xmlns:fns="http://www.faa.gov/aim/fns/1.0"
xmlns:ns9="http://www.aixm.aero/schema/5.1/message">
      <fns:hasResponse>
        <fns:NotamResponse gml:id="NotamResponse_1">
          <fns:status>OK</fns:status>
          <fns:message>SUCCESS</fns:message>
          <fns:hasNotam>
            <fns:FNSNotam gml:id="fnsNotam_1">
              <fns:transactionID>2281532</fns:transactionID>
              <fns:status>ACTIVE</fns:status>
              <fns:accountability>ACY</fns:accountability>
              <fns:notamID>TEST_07/573</fns:notamID>
               <fns:startDate>07-21</fns:startDate>
               <fns:endDate>07-01</fns:endDate>
              <fns:conditionText>!ACY TEST_07/573 ACY OBST TOWER 93 (17 AGL) 0.7 WNW LGTS OTSWEF
1007220900-1007230900</fns:conditionText>
              <fns:usNotamText/>
            </fns:FNSNotam>
          </fns:hasNotam>
        </fns:NotamResponse>
      </fns:hasResponse>
    </fnsMessage>
  </soap:Body>
</soap:Envelope>
```

Figure 3: Sample Create_NOTAM Response Message

6.1.4.3 Cancel NOTAM (Cancel_NOTAM)

This operation is used for cancelling an active NOTAM that was created using FNS. Cancellation requests can be made using either the transaction identifier supplied by the FNS system during the creation (Create_NOTAM) process or by using both the accountability and NOTAM number. Table 9 below lists the input data elements required for this operation. A sample request message for this operation is shown in Figure 4.

Table 9: Input data elements for the Cancel_NOTAM operation

Name	Description	Source Details
Username	FNS user name	/fnsMessage/fns:hasRequest/fns:FNSNotamRequest /fns:userID
Password	Password	/fnsMessage/fns:hasRequest/fns:FNSNotamRequest /fns:password
transactionID	FNS transaction Id	/fnsMessage/fns:hasRequest/fns:FNSNotamRequest / fns:FNSNotam/ fns:FNSNotam/ fns:transactionID
Accountability	The Accountability of the NOTAM. This is required if transaction ID is not provided.	/fnsMessage/fns:hasRequest/fns:FNSNotamRequest / fns:FNSNotam/ fns:FNSNotam/ fns:accountability/
Notam Number	NOTAM number. This is required if transaction ID is not provided.	/fnsMessage/fns:hasRequest/fns:FNSNotamRequest / fns:FNSNotam/ fns:FNSNotam/ fns:notamID /
requestAction	CANCEL_NOTAM	/fnsMessage/fns:hasRequest/fns:FNSNotamRequest /fns: requestAction

```
<soapenv:Envelope xmlns:soapenv="http://schemas.xmlsoap.org/soap/envelope/" xmlns:gml="http://www.opengis.net/gml/3.2"
xmlns:xlin="http://www.w3.org/1999/xlink" xmlns:ns1="http://www.aixm.aero/schema/5.1" xmlns:gmd="http://www.isotc211.org/2005/g
xmlns:gco="http://www.isotc211.org/2005/gco" xmlns:gts="http://www.isotc211.org/2005/gts" xmlns:fns="http://www.faa.gov/aim/fns/1
  <soapenv:Header/>
  <soapenv:Body>
    <fns:FNSMessage>
                <fns:hasRequest>
                                <fns:FNSNotamRequest gml:id="ID_2">
                                 <fns:userID>john.doe@faa.gov</fns:userID>
                                 <fns:password>password</fns:password>
                                <fns:requestAction>CANCEL_NOTAM</fns:requestAction>
                                                <fns:FNSNotam >
                                                                <fns:FNSNotam gml:id="FNSNotam_1">
                                                                                <fns:transactionID>2244989</fns:transactionID>
                                                                </fns:FNSNotam>
                                                </fns:FNSNotam>
                                </fns:FNSNotamRequest>
                </fns:hasRequest>
    </fns:FNSMessage>
  </soapenv:Body>
</soapenv:Envelope>
```

Figure 4: Sample request message for Cancel_NOTAM operation

Data elements contained in the response message for the Cancel_NOTAM operation is shown in Table 10 below. Also a sample response message for this operation is shown in Figure 5.

Table 10: Data elements in Cancel_Request operation

Name	Description	Possible values	XPATH location
status	Status of the request	OK ERROR	/fnsMessage/fns:hasRequest/fns:NotamResponse/fns:status
message	Message for processing the request		/fnsMessage/fns:hasRequest/fns:NotamResponse/fns:message
NOTAM	NOTAM element for successful cancel operation		/fnsMessage/fns:hasRequest/fns:NotamResponse/fns:theFNSNotam

```
<soap:Envelope xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/">
  <soap:Body>
    <fnsMessage xmlns:ns2="http://www.opengis.net/gml/3.2" xmlns:ns3="http://www.w3.org/1999/xlink"
xmlns:ns4="http://www.isotc211.org/2005/gco" xmlns:ns5="http://www.isotc211.org/2005/gmd"
xmlns:ns6="http://www.aixm.aero/schema/5.1" xmlns:ns7="http://www.isotc211.org/2005/gts"
xmlns:ns8="http://www.aixm.aero/schema/5.1/event" xmlns:ns9="http://www.faa.gov/aim/fns/1.0"
xmlns:ns10="http://www.aixm.aero/schema/5.1/message">
      <ns2:boundedBy xsi:nil="true" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"/>
      <ns9:hasResponse>
        <ns9:NotamResponse ns2:id="NotamResponse_1">
          <ns9:status>OK</ns9:status>
          <ns9:message>SUCCESS</ns9:message>
          <ns9:hasNotam>
            <ns9:FNSNotam ns2:id="fnsNotam_1">
              <ns9:transactionID>2281532</ns9:transactionID>
              <ns9:status/>
              <ns9:accountability>ACY</ns9:accountability>
              <ns9:notamID>07/573</ns9:notamID>
              <ns9:conditionText>!ACY TEST_07/573 ACY OBST TOWER 93 (17 AGL) 0.7 WNW LGTS OTSWEF 1007220900-
1007230900</ns9:conditionText>
              <ns9:usNotamText/>
            </ns9:FNSNotam>
          </ns9:hasNotam>
        </ns9:NotamResponse>
      </ns9:hasResponse>
    </fnsMessage>
  </soap:Body>
</soap:Envelope>
```

Figure 5: Sample response message for Cancel_NOTAM operation

6.1.4.4 Check NOTAM Status (Check_NOTAM_Status)

This operation is provided by FNS SysLink interface to allow the NOTAM originator to check the status of their submission. This is particularly useful for submissions for which status is not immediately available in the response to the request. For almost all digital NOTAM submissions, NOTAM number is provided immediately as response to the submission. But for scenarios which require NOTAMs to be submitted for manual review, this operation can be used to check the status.

The data elements in the request message for this operation are shown in Table 11 and the sample request message is shown in Figure 6 below.

Table 11: Data elements for Check_NOTAM_Status operation

Name	Description	Source Details
Username	FNS username	/fnsMessage/fns:hasRequest/fns:FNSNotamRequest/fns:userID
Password	Password	/fnsMessage/fns:hasRequest/fns:FNSNotamRequest/fns:password
transactionID	FNS transaction id. This parameter can be used to check status of submissions in any status.	/fnsMessage/fns:hasRequest/fns:FNSNotamRequest/ fns:FNSNotam/ fns:FNSNotam/ fns:transactionID
Accountability	The Accountability of the NOTAM. This is required if transaction ID is not provided. Can be used only for active submissions	/fnsMessage/fns:hasRequest/fns:FNSNotamRequest/ fns:FNSNotam/ fns:FNSNotam/ fns:accountability/
Notam Number	NOTAM number. This is required if transaction ID is not provided.	/fnsMessage/fns:hasRequest/fns:FNSNotamRequest/ fns:FNSNotam/ fns:FNSNotam/ fns:notamID /
requestAction	CHECK_NOTAM_STATUS	/fnsMessage/fns:hasRequest/fns:FNSNotamRequest/fns:requestAction

```
<soapenv:Envelope xmlns:soapenv="http://schemas.xmlsoap.org/soap/envelope/" xmlns:gml="http://www.opengis.net/gml/3.2"
xmlns:xlin="http://www.w3.org/1999/xlink" xmlns:ns1="http://www.aixm.aero/schema/5.1"
xmlns:gmd="http://www.isotc211.org/2005/gmd" xmlns:gco="http://www.isotc211.org/2005/gco"
xmlns:gts="http://www.isotc211.org/2005/gts" xmlns:fns="http://www.faa.gov/aim/fns/1.0">
  <soapenv:Header/>
  <soapenv:Body>
    <fns:FNSMessage>
      <fns:hasRequest>
        <fns:FNSNotamRequest gml:id="ID_2">
          <fns:userID>john.doe@faa.gov</fns:userID>
          <fns:password>password</fns:password>
          <fns:requestAction>CHECK_NOTAM_STATUS</fns:requestAction>
          <fns:FNSNotam >
            <fns:FNSNotam gml:id="FNSNotam_1">
              <fns:transactionID>2245106</fns:transactionID>
            </fns:FNSNotam>
          </fns:FNSNotam>
        </fns:FNSNotamRequest>
      </fns:hasRequest>
    </fns:FNSMessage>
  </soapenv:Body>
</soapenv:Envelope>
```

Figure 6: Sample request message for Check_NOTAM_Status operation

Similarly the data elements for Check_NOTAM_Status response message is shown in Table 12 and the sample response message in Figure 7 below.

Table 12: Data elements contains in the response message for Check_NOTAM_Status

Name	Description	Possible values	XPATH location
status	The status of the request	OK ERROR	/fnsMessage/fns:hasRequest/fns:NotamResponse/fns:status
message	Detailed message on processing the request		/fnsMessage/fns:hasRequest/fns:NotamResponse/fns:message
NOTAM	The created NOTAM if it is successfully created		/fnsMessage/fns:hasRequest/fns:NotamResponse/fns:theFNSNotam

```
<soap:Envelope xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/">
  <soap:Body>
    <fnsMessage xmlns:ns1="http://www.opengis.net/gml/3.2" xmlns:ns2="http://www.w3.org/1999/xlink"
xmlns:ns3="http://www.isotc211.org/2005/gco" xmlns:ns4="http://www.isotc211.org/2005/gmd"
xmlns:ns5="http://www.aixm.aero/schema/5.1" xmlns:ns6="http://www.isotc211.org/2005/gts"
xmlns:ns7="http://www.aixm.aero/schema/5.1/event" xmlns:ns8="http://www.faa.gov/aim/fns/1.0"
xmlns:ns9="http://www.aixm.aero/schema/5.1/message">
      <ns8:hasResponse>
        <ns8:NotamResponse ns1:id="NotamResponse_1">
          <ns8:status>OK</ns8:status>
          <ns8:message>SUCCESS</ns8:message>
          <ns8:hasNotam>
            <ns8:FNSNotam ns1:id="fnsNotam_1">
              <ns8:transactionID>2245106</ns8:transactionID>
              <ns8:status>ACTIVE</ns8:status>
              <ns8:accountability>ACY</ns8:accountability>
              <ns8:notamID>TEST_07/566</ns8:notamID>
              <ns8:conditionText>!ACY TEST_07/566 ACY OBST TOWER 93 (17 AGL) 0.7 WNW LGTS OTSWEF 1007210900-
1007220900</ns8:conditionText>
              <ns8:usNotamText/>
            </ns8:FNSNotam>
          </ns8:hasNotam>
        </ns8:NotamResponse>
      </ns8:hasResponse>
    </fnsMessage>
  </soap:Body>
</soap:Envelope>
```

Figure 7: Sample response message for Check_NOTAM_Status operation

6.1.4.5 Get Feature Information (RetrieveFeatureInfo)

This operation provides baseline (static data) information about the feature in AIXM. This is useful to get the details of the feature and can be potentially used to verify the baseline information before a NOTAM is issued on it. This is an optional operation and is not required to submit a NOTAM. This operation requires as input either the UUID (Universally Unique Identifier) of the feature or the unique feature name. Currently this service is available only for obstacle data. For airport data, static data can be obtained from the AIMdb service available at http://172.27.173.54:8080/aimdbServices.

As an example, for towers the unique feature name is either the FAA's ASN (Aeronautical Study Number) or the FCC's ASR (Antenna Structure Registration) number. Baseline data regarding the feature will be provided as AIXMBasic message. The data elements for the request message are listed in table 13 and a sample request message in Figure 8 below.

Table 13: Required parameters for RetrieveFeatureInfo Request

Name	Description	XPATH from the SOAP body
Username	FNS user name	/RetrieveFeatureInfoRequest/userInfo/userName
Password	Password	/RetrieveFeatureInfoRequest/userInfo/password
Feature UUID	The unique id of the feature. This parameter is optional. But if this is not provided, the unique Feature Name parameter is required.	/RetrieveFeatureInfoRequest/featureUUID
Feature Unique Name	The unique name of the feature. In case of Tower, this should be ASR or ASN.	/RetrieveFeatureInfoRequest/ featureUniqueName

```
<soapenv:Envelope xmlns:soapenv="http://schemas.xmlsoap.org/soap/envelope/">
  <soapenv:Header/>
  <soapenv:Body>
    <RetrieveFeatureInfoRequest>
      <featureUniqueName>2004-AEA-221-NRA</featureUniqueName>
      <userInfo>
        <userName>john.doe@faa.gov</userName>
        <password>password</password>
      </userInfo>
    </RetrieveFeatureInfoRequest>
  </soapenv:Body>
</soapenv:Envelope>
```

Figure 8: Sample request message for RetrieveFeatureInfo operation

The sample response message for the above request is shown in Figure 9 below. The AIXM Message has two feature members. One is VerticalStructure; another feature member is the airportHeliport that is the airport closest to the vertical structure. VerticalStructure feature has some basic information about the tower, like the location and vertical extension.

```
<?xml version="1.0" encoding="UTF-8"?>
<soap:Envelope xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/">
  <soap:Body>
    <RetrieveFeatureInfoResponse xmlns:gml="http://www.opengis.net/gml/3.2"
xmlns:ns2="http://www.w3.org/1999/xlink" xmlns:ns3="http://www.isotc211.org/2005/gco"
xmlns:ns4="http://www.isotc211.org/2005/gmd" xmlns:aixm="http://www.message.aero/schema/5.1"
xmlns:ns6="http://www.isotc211.org/2005/gts"
xmlns:ns7="http://www.message.aero/schema/5.1/event" xmlns:fns="http://www.faa.gov/aim/fns/1.0"
xmlns:message="http://www.message.aero/schema/5.1/message" >
      <message:hasMember>
        <aixm:AirportHeliport gml:id="AirportHeliportType_6">
          <gml:identifier codeSpace="airportCodeSpace">ACY</gml:identifier>
          <aixm:timeSlice>
            <aixm:AirportHeliportTimeSlice gml:id="AirportHeliportTimeSliceType_8">
              <gml:validTime>
                <gml:TimeInstant gml:id="TimeInstantType_7">
                  <gml:timePosition>2010-07-21T09:00:00</gml:timePosition>
                </gml:TimeInstant>
              </gml:validTime>
              <aixm:interpretation>BASELINE</aixm:interpretation>
              <aixm:designator>ACY</aixm:designator>
            </aixm:AirportHeliportTimeSlice>
          </aixm:timeSlice>
        </aixm:AirportHeliport>
      </message:hasMember>
      <message:hasMember>
        <aixm:VerticalStructure gml:id="VerticalStructureType_9">
          <gml:identifier codeSpace="featureCodeSpace">featureID</gml:identifier>
          <aixm:timeSlice>
            <aixm:VerticalStructureTimeSlice gml:id="VerticalStructureTimeSliceType_12">
              <gml:validTime>
                <gml:TimeInstant gml:id="TimeInstantType_13">
                  <gml:timePosition>2010-07-21T09:00:00</gml:timePosition>
                </gml:TimeInstant>
              </gml:validTime>
              <aixm:interpretation>SNAPSHOT</aixm:interpretation>
              <aixm:name>2004-AEA-221-NRA</aixm:name>
              <aixm:type>TOWER</aixm:type>
              <aixm:lighted>YES</aixm:lighted>
              <aixm:part>
                <aixm:VerticalStructurePart gml:id="VerticalStructurePartType_14">
                  <aixm:verticalExtent uom="FT">1000</aixm:verticalExtent>
                  <aixm:designator>ASR1058102</aixm:designator>
                  <aixm:horizontalProjection_location>
                    <aixm:ElevatedPoint gml:id="ElevatedPointType_15">
                      <gml:pos>38.0 138.0</gml:pos>
                      <aixm:elevation uom="FT">67</aixm:elevation>
                    </aixm:ElevatedPoint>
                  </aixm:horizontalProjection_location>
                </aixm:VerticalStructurePart>
```

```
                    </aixm:part>
                    <aixm:extension>
                      <fns:VerticalStructureExtension gml:id="VerticalStructureExtensionType_16">
                        <fns:closestAirport ns2:href="#AirportHeliportType_6"/>
                      </fns:VerticalStructureExtension>
                    </aixm:extension>
                  </aixm:VerticalStructureTimeSlice>
                </aixm:timeSlice>
              </aixm:VerticalStructure>
            </message:hasMember>
          </RetrieveFeatureInfoResponse>
        </soap:Body>
      </soap:Envelope>
```

Appendix A
(FNS Scenarios)

Scenario Type	Affected Feature	Description
AD_PAEW	Aerodrome	For reporting personnel and equipment work at Aerodrome
AERODROME_CLOSURE	Aerodrome	For reporting Aerodrome closure
AERODROME_CONSTRUCTION_STATUS	Aerodrome	For reporting Aerodrome Construction status
APRON_CLOSURE	Apron	For reporting Apron closure
APRON_CONSTRUCTION_STATUS	Apron	For reporting Apron Construction Status
APRON_GROUND_LIGHT_STATUS	Apron	For reporting change in Apron ground lighting status
APRON_GROUND_MARKING_STATUS	Apron	For reporting change in Apron ground marking status
APRON_PAEW	Apron	For reporting personnel and equipment work at or near Apron
APRON_SURFACE_CONDITION	Apron	For reporting on Apron surface condition
APRON_WILDLIFE_HAZARD	Apron	For reporting wild life activity on or near Apron
ARFF_AVAILABILITY	Aerodrome	For reporting change in Aircraft Rescue and Fire Fighting (ARFF) Availability
BEACON_STATUS	Aerodrome	For reporting change in Beacon status at Aerodrome
FUEL_AVAILABILITY	Aerodrome	For reporting change in fuel availability status at Aerodrome
HELIPAD_STATUS	Aerodrome	For reporting change in Helipad status
OBSTRUCTION_TOWER_LIGHTS_OUT_OF_SERVICE	Obstruction	For reporting light outage of Towers/vertical structures
RUNWAY_CLOSURE	Runway	For reporting Runway closures
RUNWAY_CONSTRUCTION_STATUS	Runway	For reporting Runway Construction Status
RUNWAY_CONTINUOUS_SNOW_REMOVAL	Runway	For reporting Runway continuous snow and ice removal
RUNWAY_DISTANCE_AVAILABLE	Runway	For reporting change in Runway distance available (eg., LDA, ASDA)
RUNWAY_GROUND_LIGHT_STATUS	Runway	For reporting change in Runway ground lighting status
RUNWAY_GROUND_MARKING_STATUS	Runway	For reporting change in Runway ground marking status
RUNWAY_LIGHT_OBSCURED	Runway	For reporting Runway light being obscured
RUNWAY_MARKING_CHANGE	Runway	For reporting change in Runway marking change

RUNWAY_PAEW	Runway	For reporting personnel and equipment work at or near Runway
RUNWAY_PROPERTY_CHANGE	Runway	For reporting change in Runway properties like length and width
RUNWAY_SURFACE_CONDITION	Runway	For reporting Runway surface condition
RUNWAY_THRESHOLD_DISCPLACEMENT	Runway	For reporting change in Runway threshold displacement values
RUNWAY_VFR_PATTERN	Runway	For reporting change in Runway VFR pattern
RUNWAY_WILDLIFE_HAZARD	Runway	For reporting wild life activity on or near Runway
TAXIWAY_CLOSURE	Taxiway	For reporting Taxiway closure
TAXIWAY_CONSTRUCTION_STATUS	Taxiway	For reporting Taxiway Construction Status
TAXIWAY_GROUND_LIGHT_STATUS	Taxiway	For reporting change in Taxiway ground lighting status
TAXIWAY_GROUND_MARKING_STATUS	Taxiway	For reporting change in Taxiway ground marking status
TAXIWAY_PAEW	Taxiway	For reporting personnel and equipment work at or near Taxiway
TAXIWAY_SURFACE_CONDITION	Taxiway	For reporting Taxiway surface condition
TAXIWAY_WILDLIFE_HAZARD	Taxiway	For reporting wild life activity on or near Taxiway
WIND_INDICATOR_STATUS	Aerodrome	For reporting change in wind indicator status

Appendix B
(FNS System Interface Service Level Agreement)

TBD