

# Aerospace Systems

## *Material Acquisition Pull System (MAPS)*

### User Instructions

Revision M

11/10/2015



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## **General**

The Material Acquisition Pull System (MAPS) has been developed and implemented at Aerospace Systems as part of our lean transformation initiative. This new purchase order delivery authorization process enables us to link the supply chain for selected material and components to the actual consumption at the point of use.

## **System Description**

MAPS is basically a hybrid minimum and maximum process. Rather than fixed quantity parameters, the required inventory levels are established and maintained based on weeks of coverage criteria. Although the weeks of coverage for a given part may remain constant, the quantity of parts required during those weeks may vary resulting in changes to the minimum and maximum thresholds.

For each part number assigned to MAPS, a weekly program extracts data from the Northrop Grumman SAP Material Requirements Planning (MRP) system and purchasing system. The primary data elements extracted are the part number, description, supplier name, supplier number, open requirements, on-hand inventory quantity, open purchase order quantity, planned requirements, last receipt transaction data, and the minimum and maximum weeks of coverage required.

The extraction program also performs a series of conversion calculations to determine the minimum and maximum stock levels for each part. A smoothing feature has been implemented that utilizes either the total quantity required during the specified weeks of coverage or a calculation based on an average weekly value times the specified weeks of coverage, whichever is greater. Data fields in the SAP system material masters control the minimum and maximum stock levels. These values can vary from part to part and can be adjusted through negotiation with the responsible buyer and MRP controller. Once the extraction and calculations are completed, a flat file is prepared and transmitted for posting on the On-line Automated Supplier Information System (OASIS) website.

This data is reformatted into Microsoft Excel spreadsheets for easy viewing, downloading, and printing. Two files are created, a Pull Signal File and a Forecast Usage File. These OASIS files are created and made available to the suppliers every Monday morning by 12:00 PST. The naming convention for the three files is the supplier number followed by the name of the file. (xxxxxxxxxxForecast.xlsx, xxxxxxxxxxxxPull.xlsx, and xxxxxxxxxxxxCombined.xlsx).

## **File Definitions**

**Pull Signal File** – This file provides summary level data for each part. This data includes the minimum quantity, maximum quantity, on-hand quantity, open purchase order numbers and balances due and the last receipt date and quantity.

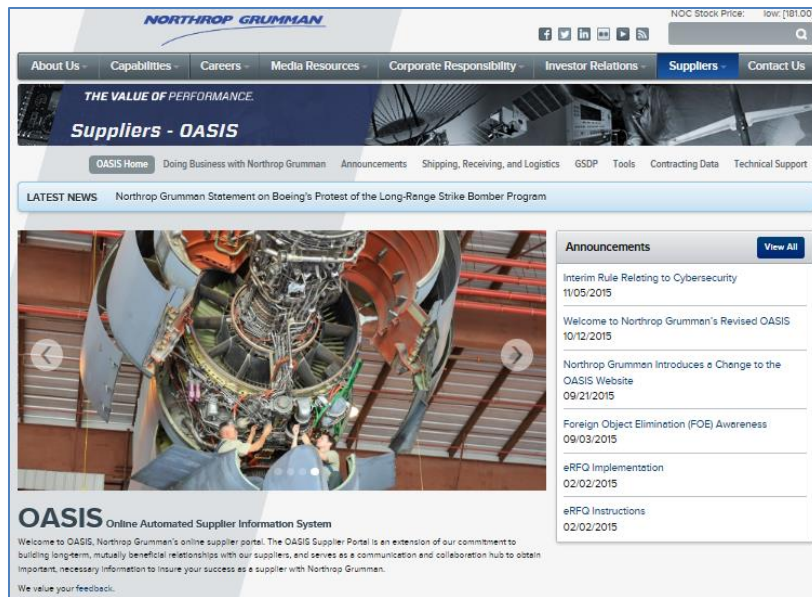
**Forecast Usage File** – This file provides the detailed schedule requirements for each part along with the current allocation of the on-hand coverage and open purchase order quantities.

**Combined File** – This file contains two tabs: one for the Forecast Usage File and one for the Pull File.

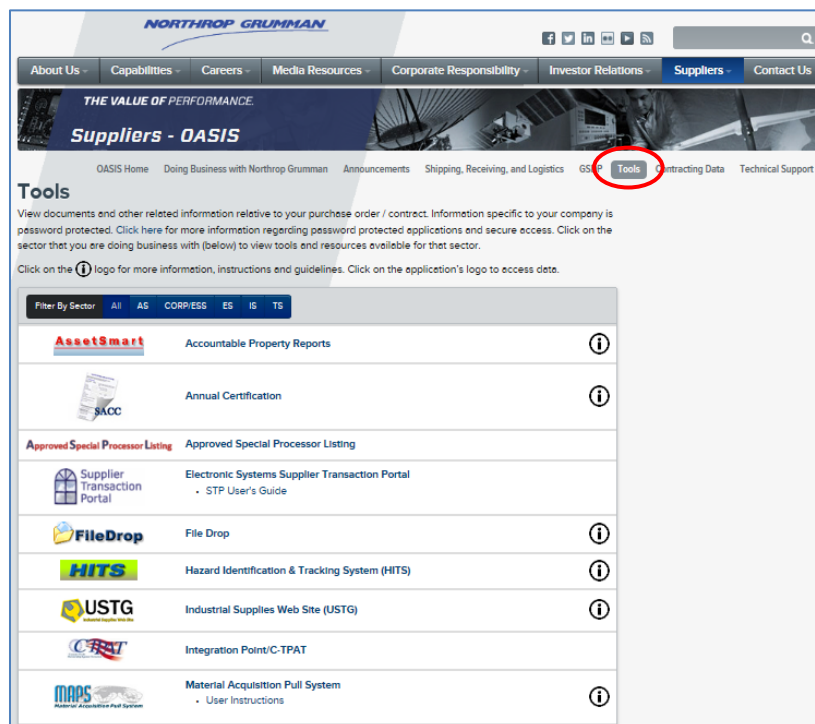


## Accessing the System

Access MAPS via OASIS at <http://www.northropgrumman.com/Suppliers/Pages/default.aspx>

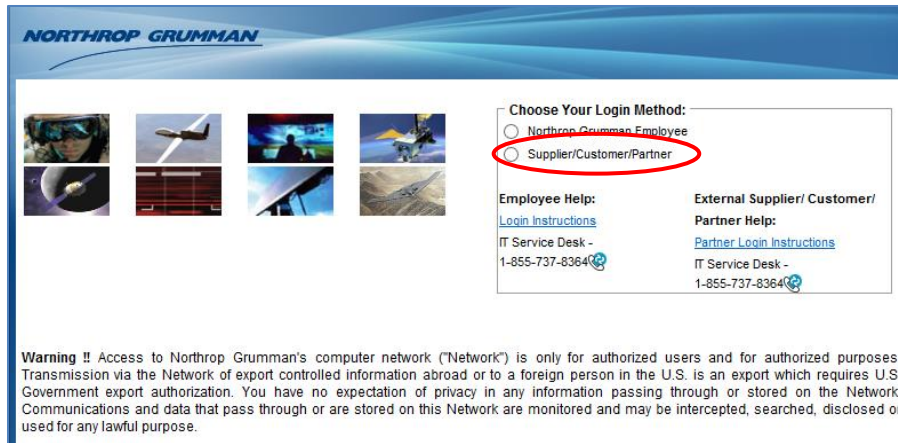


After accessing OASIS, click on “Tools” from the upper menu which will display the OASIS Tools page.

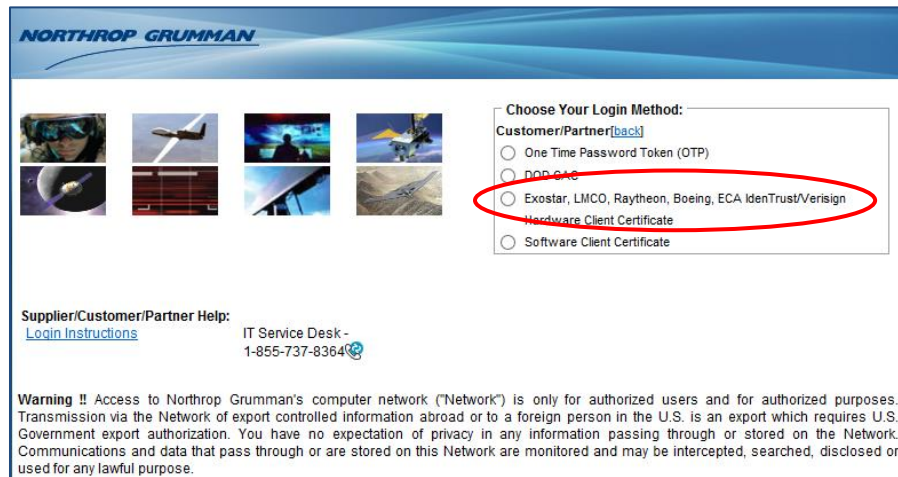




Clicking on the MAPS link will open a logon dialog box. Click the “Supplier/Customer/Partner” radio button.



Choose your login method (will be Exostar for most users).





Enter your User ID and Password.

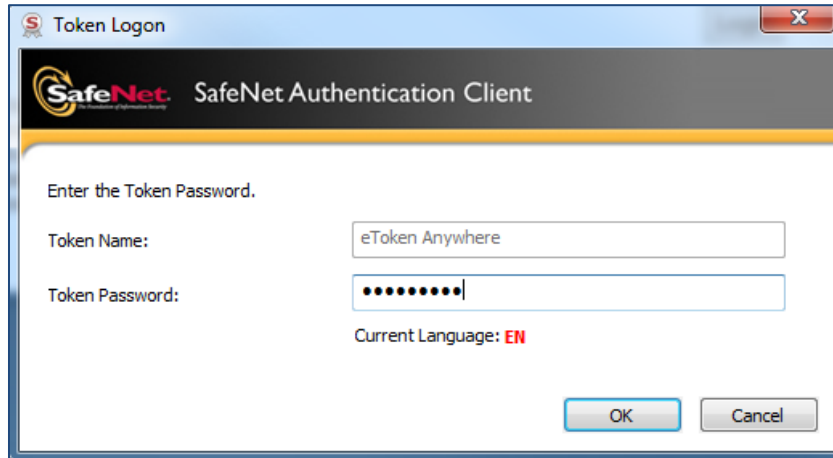
The screenshot shows the login interface for the MAPS system. At the top left is the Northrop Grumman logo. Below it are four small images representing different aspects of the system. On the right, there is a "Choose Your Login Method:" section with radio buttons for "One Time Password Token (OTP)", "DDD CAC", "Exostar, LMCO, Raytheon, Boeing, ECA IdenTrust/Verisign Hardware Client Certificate" (which is selected), and "Software Client Certificate". Below this is a "User Name:" field with a masked password "xxxxxxxx" and a "Password:" field with masked characters ".....". A red circle highlights these two fields. A "Login" button is located below the password field. On the left side, there is a "Supplier/Customer/Partner Help:" section with a link to "Login Instructions" and contact information for the IT Service Desk: "1-855-737-8364". At the bottom, there is a "Warning" message about network access and data security.

Select your Certificate (will be Exostar for most users).

The screenshot shows a "Windows Security" dialog box titled "Select a Certificate". It has an "Other User" section with fields for "User name", "Password", and a dropdown menu showing "NORTHGRUM". Below this are several "Test User Account" entries, each with a certificate icon, issuer name, and validity dates. The entry for "Exostar Federated Identity Ser..." is circled in red. At the bottom are "OK" and "Cancel" buttons.



Input your Token PIN (password).



You are now logged into MAPS.



Clicking on any of the links will bring up an Excel file containing the data defined in the following section.

**Appendices:**

**A. Forecast File**

The forecast file provides the detailed schedule for open requirements in the SAP MRP system. In addition, the allocation of the on-hand inventory and on-order quantities are provided for reference. The following table defines fields in the forecast file.



The first 52 columns display the next 52 weeks of open requirements. The following columns display monthly, open requirements, followed by a single column that displays any remaining balances.

\*Engineering revisions will either cause change to requirements or result in removal of the part from the MAPS data. Consult your NG Procurement or Sub Contract Representative, if necessary.

Field	DEFINITION
Week Ending	The Friday date of the week that the requirement is scheduled to be issued to Manufacturing
Requirement	Open requirements based on current master schedules and independent demands including ahead and behind schedule conditions
Inventory	Allocation of current inventory to open requirements
On-Order	Allocation of on-order coverage to open requirements
Req. Or Planned	Allocation of planned materials to requirements

## B. Pull Signal File

The pull signal file contains the summary level data required related to each part assigned to MAPS. The table below defines the fields provided on this report.

Field	Definition
Part Number	Part number of the material on order
Description	Description of the material on order
Buyer	Responsible Northrop Grumman buyer
Min. Weeks	Minimum weeks of coverage required
Min. Qty	Minimum on-hand inventory level required
Current Inventory	Current inventory level in NG stockroom
Max. Qty	Maximum on-hand inventory allowed
Max. Weeks	Maximum weeks of coverage required
Priority	<b>Priority 3</b> = Less than minimum on-hand <b>Priority 2</b> = No on-hand inventory
PO/Item	Existing purchase order for the part number listed. Up to four PO's may be listed.
PO Qty	Quantity of the items on the purchase order
Total On Order	Total number of parts/material on order. This is a sum of all PO's listed above.
Last Receipt Date	Date the last receipt for the part was made
Last Receipt Qty	Quantity last received associated with the last receipt date
Total Planned	Number of parts that are planned but not yet on a purchase order
Total Open Reqmts	Sum of all NG requirements to be replenished by parts in inventory, on order, and planned



### **C. Minimum/Maximum Calculations**

1. The minimum weeks of coverage required for each part number is determined by dividing the Goods Receipt Processing Time (GRPT) in the SAP material master by 5 and rounding up to the next whole number.
2. The minimum quantity required is determined by performing the following two calculations and utilizing whichever result is greater.
  - a. Add the quantity of open requirements for the minimum weeks of coverage required.
  - b. Calculate the average open requirements for the next six weeks and multiply that value times the minimum number of weeks of coverage and round up to the next whole number.
3. The maximum weeks of coverage required for each part number is determined by adding the minimum weeks of coverage to the Lot Size in the SAP material master (Lot Size conversion to weeks: MB=4, M2=8, QT=12, M4=16, SA=26 and YM=52).
4. The maximum quantity required is determined by performing the following two calculations and utilizing whichever result is greater.
  - a. Add the quantity of open requirements for the maximum weeks of coverage required.
  - b. Calculate the average open requirements for the next twelve weeks and multiply that value times the maximum number of weeks of coverage required and round up to the next whole number.
  - c. Any behind schedule weekending without open requirements is excluded from the weekly minimum and maximum calculations (reference example #6).

Example # 1 Unissued Requirements											
11/21/03	11/28/03	12/05/03	12/12/03	12/19/03	12/26/03	1/02/04	1/09/04	1/16/04	1/23/04	1/30/04	2/06/04
1	2	2	1	1	0	2	1	2	1	1	2

**Minimum Calculation**

Next 3 Weeks Unissued Requirements = 5  
 Weekly Average Next 6 Weeks =  $1.17 \times 3 = 4$

**Maximum Calculation**

Next 7 Weeks Unissued Requirements = 9  
 Weekly Average Next 12 Weeks =  $1.33 \times 7 = 10$

Example # 2 Unissued Requirements											
11/21/03	11/28/03	12/05/03	12/12/03	12/19/03	12/26/03	1/02/04	1/09/04	1/16/04	1/23/04	1/30/04	2/06/04
1	0	1	2	1	2	0	1	1	2	2	2

**Minimum Calculation**

Next 3 Weeks Unissued Requirements = 2  
 Weekly Average Next 6 Weeks =  $1.17 \times 3 = 4$

**Maximum Calculation**

Next 7 Weeks Unissued Requirements = 7  
 Weekly Average Next 12 Weeks =  $1.25 \times 7 = 9$

**\* Notional Data Based On a Current Week of 11/21/03**

Example # 3 Unissued Requirements											
11/21/03	11/28/03	12/05/03	12/12/03	12/19/03	12/26/03	1/02/04	1/09/04	1/16/04	1/23/04	1/30/04	2/06/04
0	0	0	8	0	0	0	8	0	0	0	8

**Minimum Calculation**

Next 3 Weeks Unissued Requirements = 0  
 Weekly Average Next 6 Weeks =  $1.33 \times 3 = 4$

**Maximum Calculation**

Next 7 Weeks Unissued Requirements = 8  
 Weekly Average Next 12 Weeks =  $2.0 \times 7 = 14$

Example # 4 Unissued Requirements											
11/21/03	11/28/03	12/05/03	12/12/03	12/19/03	12/26/03	1/02/04	1/09/04	1/16/04	1/23/04	1/30/04	2/06/04
0	0	8	0	0	0	8	0	0	0	8	0

**Minimum Calculation**

Next 3 Weeks Unissued Requirements = 8  
 Weekly Average Next 6 Weeks =  $1.33 \times 3 = 4$

**Maximum Calculation**

Next 7 Weeks Unissued Requirements = 16  
 Weekly Average Next 12 Weeks =  $2.0 \times 7 = 14$

**\* Notional Data Based On a Current Week of 11/21/03**

Example # 5 Unissued Requirements											
11/21/03	11/28/03	12/05/03	12/12/03	12/19/03	12/26/03	1/02/04	1/09/04	1/16/04	1/23/04	1/30/04	2/06/04
0	0	0	0	0	0	1	2	1	1	2	1

**Minimum Calculation**

Next 3 Weeks Unissued Requirements = 0  
 Weekly Average Next 6 Weeks =  $0 \times 3 = 0$

**Maximum Calculation**

Next 7 Weeks Unissued Requirements = 1  
 Weekly Average Next 12 Weeks =  $0.6 \times 7 = 5$

Example # 6 Unissued Requirements													
11/07/03	11/14/03	11/21/03	11/28/03	12/05/03	12/12/03	12/19/03	12/26/03	1/02/04	1/09/04	1/16/04	1/23/04	1/30/04	2/06/04
2	0	2	2	0	1	2	1	1	2	0	1	1	1

**Minimum Calculation**

Next 3 Weeks Unissued Requirements = 6  
 Weekly Average Next 6 Weeks =  $1.5 \times 3 = 5$

**Maximum Calculation**

Next 7 Weeks Unissued Requirements = 10  
 Weekly Average Next 12 Weeks =  $1.25 \times 7 = 9$

**\* Notional Data Based On a Current Week of 11/21/03**

**D. Priority Determination Logic**

1. The MAPS logic assigns a priority to parts based on a comparison of the on-hand inventory level to the total requirements for the minimum weeks of coverage as defined in the minimum / maximum calculation overview.
2. If the on-hand inventory level is equal to, or greater than, the total requirements for the minimum weeks of coverage, **the priority will be 0**
3. If the on-hand quantity is greater than zero, but less than the total requirements for the minimum weeks of coverage, **the priority will be 3**
4. If the on-hand quantity is zero, and the total requirements for the minimum weeks of coverage is greater than zero, but there are no behind schedule or current week requirements, **the priority will be 3**

5. If the on-hand quantity is zero, and the total requirements for the minimum weeks of coverage is greater than zero, and there are behind schedule or current week requirements, **the priority will be 2**
6. If the on-hand quantity is zero, and the total requirements for the minimum weeks of coverage is zero, the **priority will be 0**
7. A **Priority 1** is declared by the using organization whenever a Priority 2 item is impacting their cost or schedule performance. This level of priority is only posted in the internal parts status and tracking systems and is not currently planned to be displayed in MAPS.

**Note:** Only the actual quantity required for the minimum weeks of coverage is utilized to determine the priority. The minimum quantities that are based on the average weekly requirements are not used for this purpose

Example # 1 Unissued Requirements											
12/05/03	12/12/03	12/19/03	12/26/03	1/02/04	1/09/04	1/16/04	1/23/04	1/30/04	2/06/04	2/13/04	2/20/04
1	0	1	2	1	2	0	1	1	2	2	2

Minimum Calculation  
Next Three Weeks Unissued Requirements = 2

Priority Logic  
On-Hand = 4      Priority = 0  
On-Hand = 3      Priority = 0  
On-Hand = 2      Priority = 0  
On-Hand = 1      Priority = 3  
On-Hand = 0      Priority = 2

Example # 2 Unissued Requirements											
12/05/03	12/12/03	12/19/03	12/26/03	1/02/04	1/09/04	1/16/04	1/23/04	1/30/04	2/06/04	2/13/04	2/20/04
0	0	0	8	0	0	0	8	0	0	0	8

Minimum Calculation  
Next Three Weeks Unissued Requirements = 0

Priority Logic  
On-Hand = 4      Priority = 0  
On-Hand = 3      Priority = 0  
On-Hand = 2      Priority = 0  
On-Hand = 1      Priority = 0  
On-Hand = 0      Priority = 0

\* Notional Data Based On a Current Week of 12/05/03 \*



Example # 3 Unissued Requirements													
11/07/03	11/14/03	11/21/03	11/28/03	12/05/03	12/12/03	12/19/03	12/26/03	1/02/04	1/09/04	1/16/04	1/23/04	1/30/04	2/06/04
2	0	2	2	0	1	2	1	1	2	0	1	1	1

Minimum Calculation  
Next Three Weeks Unissued Requirements = 6

Priority Logic

- On-Hand = 6                      Priority = 0
- On-Hand = 5                      Priority = 3
- On-Hand = 4                      Priority = 3
- On-Hand = 3                      Priority = 3
- On-Hand = 2                      Priority = 3
- On-Hand = 1                      Priority = 3
- On-Hand = 0                      Priority = 2

\* Notional Data Based On a Current Week of 11/21/03 \*