PNNL-20420, Rev. 3

U.S. DEPARTMENT OF ENERGY

Second Line of Defense: Electronic Maintenance Reports

Local Maintenance Provider User Guide, Rev. 3

RJ Leigh

September 2012

Pacific Northwest NATIONAL LABORATORY

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UNITED STATES DEPARTMENT OF ENERGY
under Contract DE-AC05-76RL01830

Printed in the United States of America

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RJ Leigh

September 2012

Prepared for the U.S. Department of Energy
under Contract DE-AC05-76RL01830

Pacific Northwest National Laboratory
Richland, Washington 99352

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1.0 Electronic Maintenance Reporting

1.1 Purpose

The Electronic Maintenance Report forms allow Local Maintenance Providers (LMP) and other program staff to enter maintenance information into a simple and secure system. This document describes the features and information required to complete the Maintenance Report forms. It is expected that all Corrective Maintenance Reports from LMPs will be submitted electronically into the SLD Portal. As an exception (e.g., when access to the SLD Portal is unavailable), Maintenance Reports can be submitted via a secure Adobe PDF form available through the Sustainability Manager assigned to each country.

1.2 Requesting Access

To request Local Maintenance Provider access to the SLD Portal, submit a Service Request to the SLD Help Desk (SLDHelpDesk@pnnl.gov). An SLD Portal Administrator will verify the need for access with the corresponding Sustainability Manager/Program Management. The following information will be required to grant access:

- Name of the LMP organization
- Contract Number with the LMP
- SLD program Point of Contact that engages with the LMP (typically Sustainability Manager)
- Primary LMP Point of Contact
- Phone number of the LMP primary Point of Contact
- Email for the LMP primary Point of Contact
- List of the full names, emails and phone numbers of the individuals that will be authorized to submit data on behalf of the LMP

Once access has been granted, the Sustainability Manager will provide the LMP user with their credentials and the originating Service Request will be completed.

1.3 SLD Portal Link

Local Maintenance Providers access the Electronic Maintenance Reports via the externally-facing SLD Portal:

https://sldportal.pnl.gov/index/login

1.4 Maintenance Section in the SLD Portal

The Electronic Maintenance Report forms can be accessed via the Maintenance tab in the SLD Portal. The Maintenance tab allows the user to create new reports and edit/delete in-progress reports.

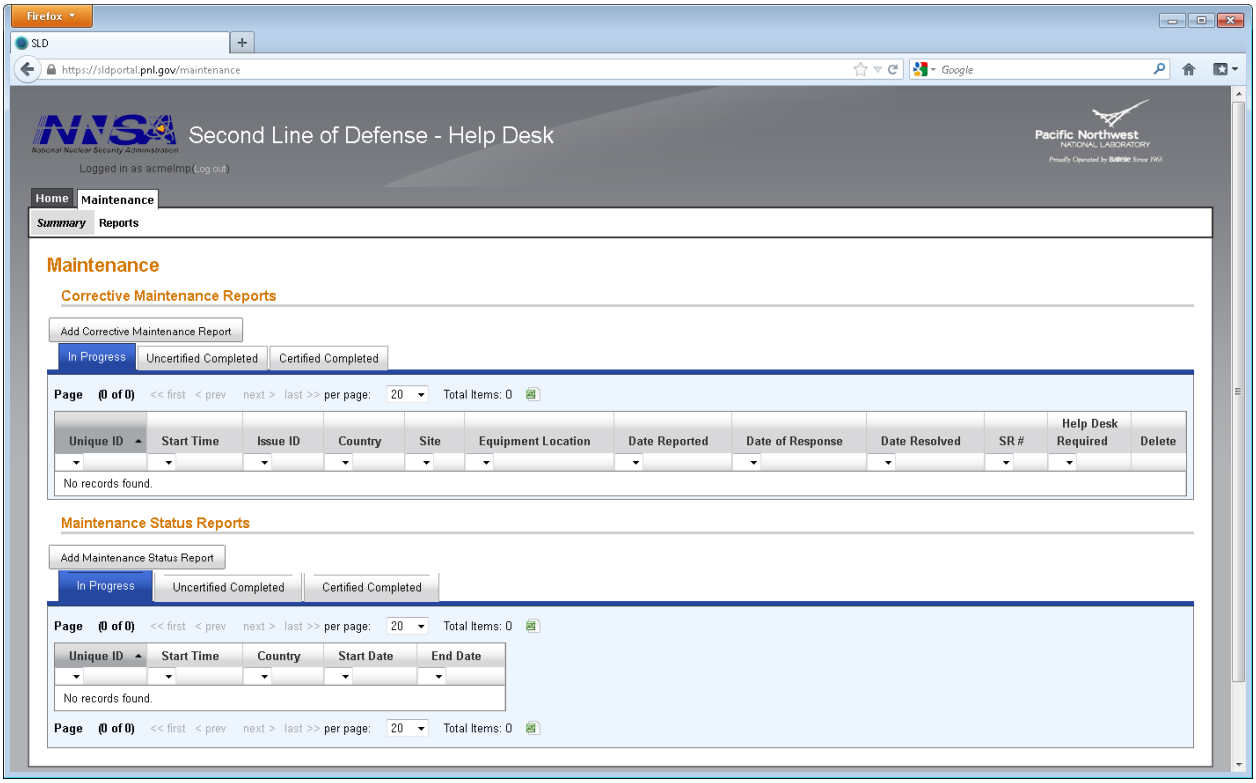

Figure 1. SLD Portal Maintenance Tab

1.4.1 Summary sub-Tab Features

The "Summary" sub-tab is the default screen displayed when a user is in the Maintenance tab of the SLD Portal. A table for both the Corrective Maintenance Reports (top) and Maintenance Status Reports (bottom) are displayed on this page with a subset of fields that allow the user to locate and manage reports. Above each table is an "Add…" button that is used to create a new report instance.

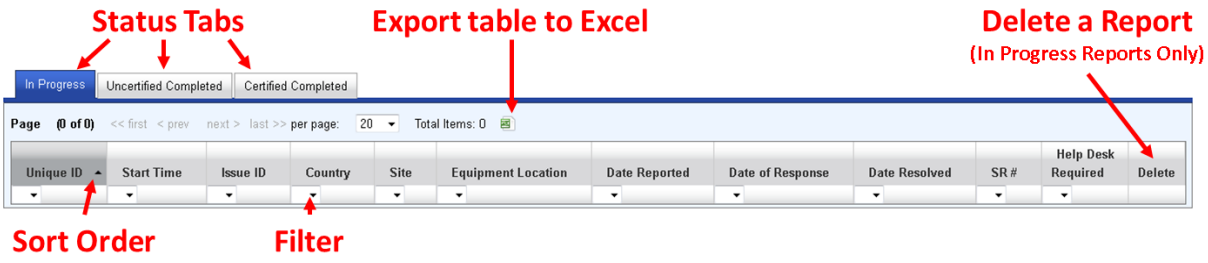

Figure 2. Example: Summary Table

1.4.1.1 Status Tabs

Each summary table is divided into tabs based upon the "status" of the reports. These status tabs differentiate between reports that are actively being worked, those that have been completed and are ready

for review by the Sustainability Manager, and those that have been reviewed and certified complete by the SM.

- ***In Progress*** – Reports that have not yet been completed; may be edited/deleted by the Local Maintenance Provider.
- ***Uncertified Completed*** – Reports that have been completed by the Local Maintenance Provider and are awaiting Sustainability Manager Review; may be viewed by the Local Maintenance Provider, but cannot be edited/deleted by the LMP.
- ***Certified Completed*** – Reports that have been certified by the Sustainability Manager as complete; these reports are read-only for all users.

More information about reviews of Maintenance Reports by the Sustainability Manager can be found in the Section 1.6: "Sustainability Manager Review of Reports".

1.4.1.2 Export to Excel

To export a subset of data from the reports listed in the Summary table, click the Excel icon (Figure 2). A dialogue box will appear asking the user to either open or save the file generated (Figure 3). This export will only include the subset of reports within the currently selected summary tab.

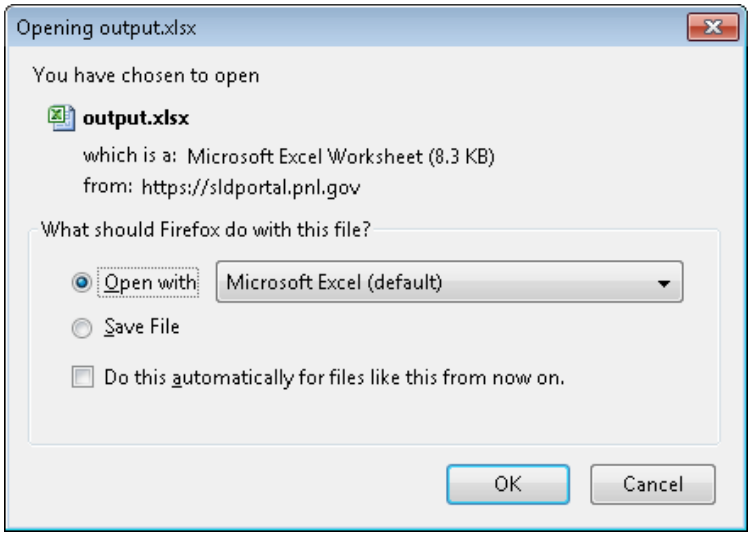

Figure 3. Example: Open/Save Excel Export Dialogue

1.4.1.3 Deleting a Report

Important: Only reports with an "In Progress" status can be deleted by Local Maintenance Reports.

Important: Deleted records cannot be recovered.

To delete an In Progress Report, click the red "X" button appearing in the far right column of the record.

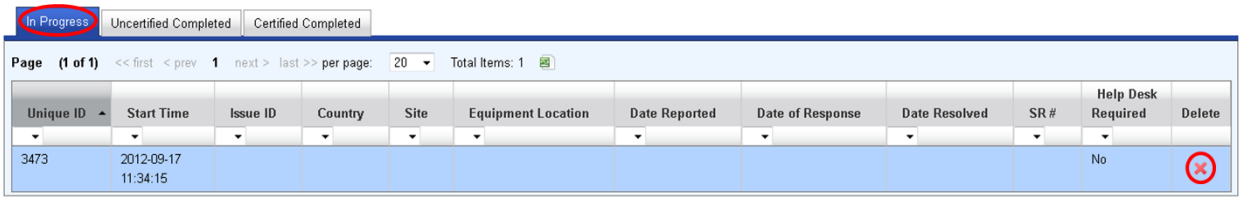

Figure 4. Example: Deleting an In Progress Report

1.4.1.4 Sort/Filter Options

The summary tables can filter and sort the results for each status tab independently. Clicking on a column label in the table will sort the results based on the values in that column. An arrow will appear to the right of the column label indicating whether the results are sorted in ascending or descending order. Click on the column label again will toggle between sort orders.

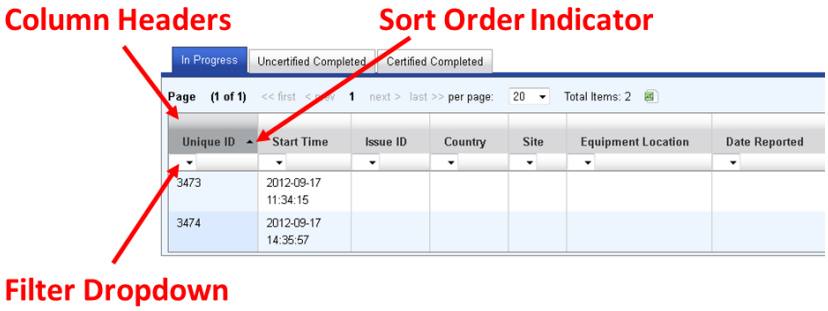

Figure 5. Example: Filter/Sort Options

As shown in Figure 5, below each column heading is a small dropdown box. When the user clicks on this box, the list of all distinct entries in that column will be populated. The user can then click on the dropdown to filter on a specific value.

1.4.2 Reports sub-Tab Features

The "Reports" sub-tab provides users with the ability to filter by Program, Country, Site, and/or relevant date fields in the report. Select the preferred filter options and click on the "Get Report" button to update the Results/Summary tables.

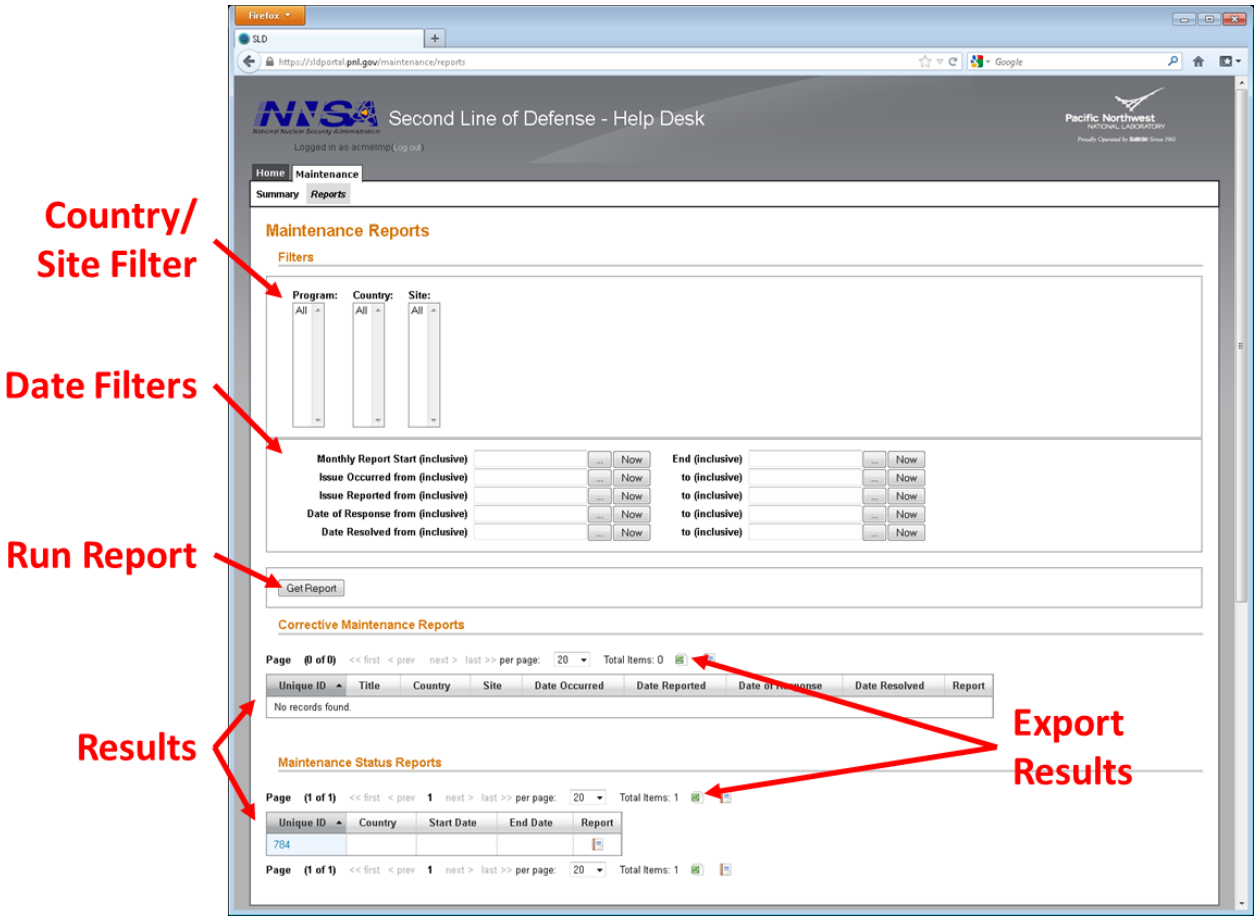

Figure 6. Report sub-Tab

To export the filtered results, including all of the form fields from the reports, click the Excel file icon for the respective summary table. Select "Open" or "Save" from the dialogue box.

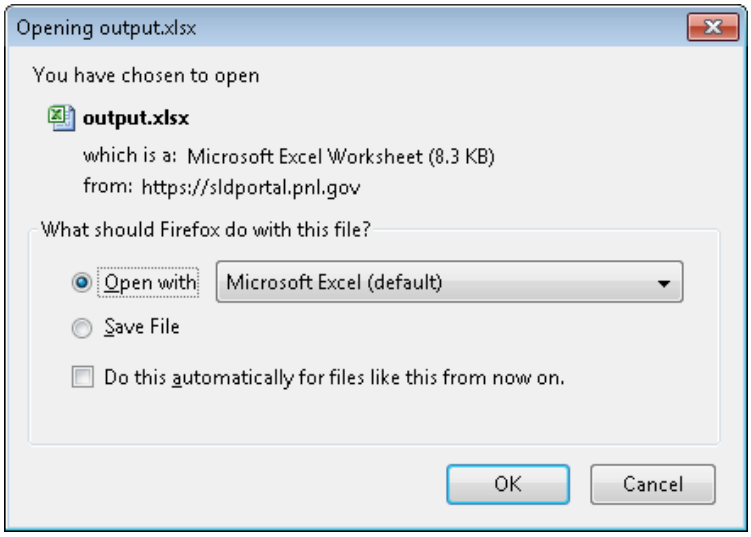

Figure 7. Open/Save Excel Export Dialogue

1.5 Report Features

The Electronic Maintenance Reports include a number of common features which are described in the following sub-sections.

1.5.1 Data Saved Automatically

The report is saved as the user moves from one field to another within the form. Saving the form as each field is changed ensures that the data is not lost if the browser window is inadvertently closed or internet connectivity is lost. This save action is represented by an animated circle icon which is shown below for reference.

Figure 8. Animated Save Icon

1.5.2 Navigation

The report forms are divided into sections, which are listed in a navigation menu on the left side of the report form. Clicking on a Section listed in the navigation menu will take the user to the corresponding report form section. Additionally, the bottom of each report form includes "Previous" and "Next "buttons. Since changes are saved at the field-level as they are completed, the user can move forward and backward in the report without losing data.

Figure 9. Example Navigation Menu (Corrective Maintenance Report)

1.5.3 Text Formatting Options

Text fields where longer free-form content may be expected have advanced formatting options. These options are presented in the tool bar at the top of these boxes and allow the user to format their text much like they would when using a word processing program (Bold, Italics, Underline, bulleted/numbered lists, etc.). Advanced copy/paste options allow users to paste text formatted in applications like Microsoft ™ Word while preserving much of its original formatting.

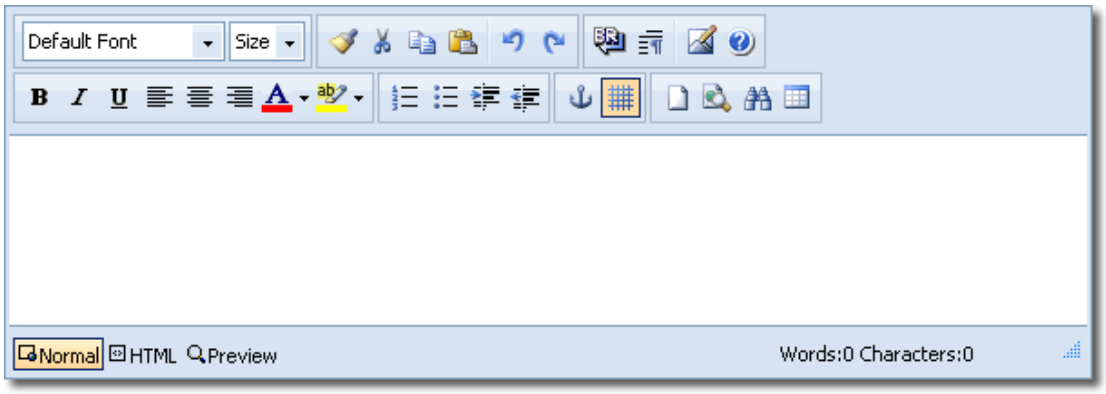

Figure 10. Text Box with Formatting Options

1.5.4 Date Field buttons

Date fields included in the reports have two buttons to aid the user in populating the field; see Figure 11. The "…" button displays the "Select Date" window that allows the user to select the date by clicking on a day displayed in the calendar; see Figure 12. The "Now" button populates the field with the current date from the clock on the user's computer. Both buttons will populate the fields in the format required by the system.

Figure 11. Example Date Field

Figure 12. Example Calendar box

1.5.5 File Attachments

Important: Attached files ***cannot*** be used in place of completing fields in the report forms.

Important: File attachments in the Maintenance Reports ***do not*** fulfill the Local Maintenance Provider requirement to upload "daily files" or perform other file archiving. Local Maintenance

Providers must continue to submit these files as required by their contract via the ORNL secure upload site.

In order to accurately document issue details for all maintenance work performed, the Local Maintenance Provider may need to attach pictures, scanned copies of checklists, or other supporting documentation. Multiple files can be added and attached to the report form. Additionally, attached files can be removed from the form prior to completion of the report.

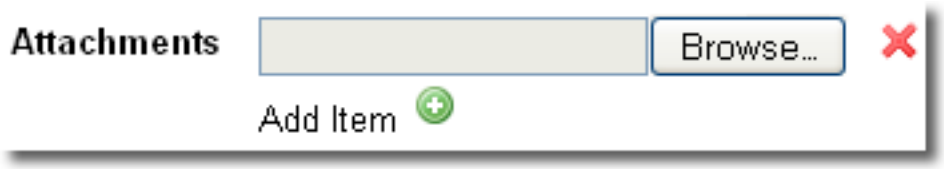

Figure 13. Optional File Attachments Field

1.6 Sustainability Manager Review of Reports

Electronic Maintenance Reports will require review by the Sustainability Manager for the corresponding Program/Country. The report forms include the ability for the Sustainability Manager to "certify" a report as complete or request additional detail from the Local Maintenance Provider. Separate guidance is provided to Sustainability Managers detailing the review/certification requirements for various report types.

1.6.1 Sustainability Manager "Certifies" a Report as Complete

A Sustainability Manager may "certify" a completed Maintenance Report by selecting the "Certify" button in the Review Section within the selected report. Once an Electronic Maintenance Report has been certified, the form is no longer editable, but may be viewed within the portal. The Local Maintenance Provider will receive an email notification when the Sustainability Manager has certified the report.

1.6.2 Sustainability Manager Requests Additional Information

Sustainability Managers have the ability to request that the Local Maintenance Provider revise a Maintenance Report by selecting the "Un-Complete" button in the Review Section within the selected report. The Sustainability Manager has the option to include a note about the reason for un-completing the report. This note is visible to the Local Maintenance Provider within the "Review" section of the uncompleted report to facilitate revision. Once the report is un-completed, the Local Maintenance Provider will receive an email notification advising that they should review the Sustainability Manager's comments on the report within the SLD Portal.

2.0 Corrective Maintenance Report Form

The Corrective Maintenance Report form is intended to capture Corrective Maintenance activities that return equipment to its original operational state. This might include troubleshooting/replacing parts that have failed degrading/disabling a system, realigning optical vehicle presence sensors, etc. Any issues that are reported to the Local Maintenance Provider by a site/Partner Country organization that require an action to return a piece of equipment to an operational state must be documented in a Corrective Maintenance Report.

Each distinct issue should be documented separately in order to support the capture of accurate system reliability data. For example, a failed component in an RPM and a failed hard drive in a CAS Server should be reported on two separate Corrective Maintenance Reports.

The LMP is responsible for completing the CMR from initial problem through resolution, including any support obtained from the SLD Help Desk, if applicable.

2.1 Issue Information (Section)

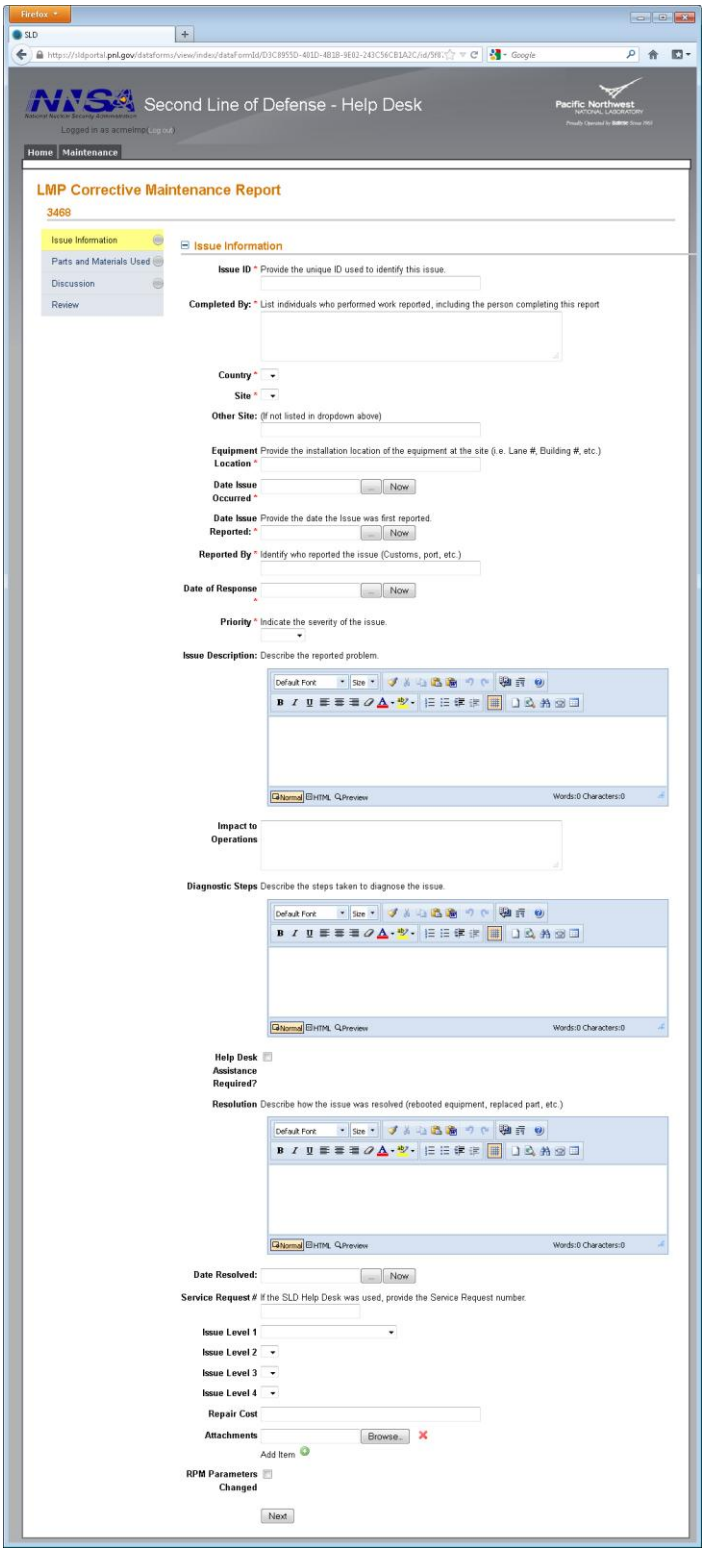

Figure 14. Corrective Maintenance Report: Issue Information Section

Issue ID – (Required) If the Local Maintenance Provider has an internal identification number used for tracking issues reported to them, they should provide that number in this field. If a site does not have an existing naming convention for tracking issues corrected by the Local Maintenance Provider, a suggested format is YYYYMMSite#### where:

- YYYYMM - four digit year and two digit month an issue was called into the LMP
- Site - the first four letters of the site name
- #### - a number starting with 0001 and is reset every January 1

Completed By – (Required) This field is intended to capture the names of the individuals who worked on the reported issue. This includes the technicians who responded to the issue (onsite or remotely) and the person completing the report. The role of each person included should also be provided.

Country – (Required) Select the Country where the site is located from the dropdown list provided.

Site – (Required) A dropdown list of sites serviced by the Local Maintenance Provider. Select the site/location, ensuring that the correct crossing type is selected (i.e. vehicle crossing (VC), rail crossing (RC), or Airport (AP)). If the issue affects multiple sites (spare parts requests) the "Country-Wide" (CW) site can be chosen. If the correct site is not represented in the dropdown list, contact the SLD Help Desk to request assistance.

Other Site - If the Site does not appear in the list above, type the name of the Site in this field; otherwise, leave this field blank.

Equipment Location – (Required) Enter the physical location of the affected equipment at the site. If the reported issue is with an RPM, provide the lane number (i.e. RPM1 Vehicle Lane 1, Pedestrian Lane 1, etc.)

Date Issue Occurred – (Required) This field is intended to capture the date and time that the issue/problem was first observed either by the Operator or the Local Maintenance Provider. The format for this date field is YYYY-MM-DD where:

- YYYY – four digit year
- MM – two digit month
- DD – two digit day

Date Issue Reported – (Required) This field is intended to capture the date and time that the issue was reported to the Local Maintenance Provider. The format for this date field is YYYY-MM-DD where:

- YYYY – four digit year
- MM – two digit month
- DD – two digit day

Reported By – (Required) Provide the name of the organization that reported the issue (Customs, Port Authority, etc.) to the Local Maintenance Provider.

Date of Response – (Required) Enter the date/time that the Local Maintenance Provider responded to the reported issue, either by remotely troubleshooting the reported problem or by visiting the site. The format for this date field is YYYY-MM-DD where:

- YYYY – four digit year
- MM – two digit month
- DD – two digit day

Priority – Identify the severity of the reported problem using the following criteria:

- ***Critical*** – Applies to issues where the system is deemed completely inoperable or diminished in function to the point that it cannot detect the target quantities and types of special nuclear material and other radioactive materials of concern. Note that the system in this instance is the entire site's capability to detect material.
- ***Major*** – Assigned to issues in which the system is still operational, but the ability to detect target quantities and types of special nuclear material and other radioactive materials of concern is hindered. This ranking will also have a focused impact on site operations, such as a site's ability to continue the movement of traffic efficiently because too many portals or lanes are not functioning.
- ***Minor*** – This priority is assigned to issues in which the system is operational with diminished, but tractable functionality. Unresolved issues remain within the system, but the issues do not impact the operational capacity to detect the target quantities and types of special nuclear material and other radioactive materials of concern.

Issue Description – (Required) Describe the issue as reported.

Impact to Operations – (Required) Describe the impact of the reported problem on the site's operations (e.g., how many lanes down, impact on detection capability).

Diagnostic Steps – (Required) Describe the diagnostic steps taken, and the results of each step. If troubleshooting took place over multiple days, identify the day on which each diagnostic step/action was taken.

Help Desk Assistance Required? – Check this box to engage the SLD Help Desk by creating a Service Request. A dialogue box will appear to verify that assistance is needed. Click "Yes" to open a Service Request, or click "No" to return to the form.

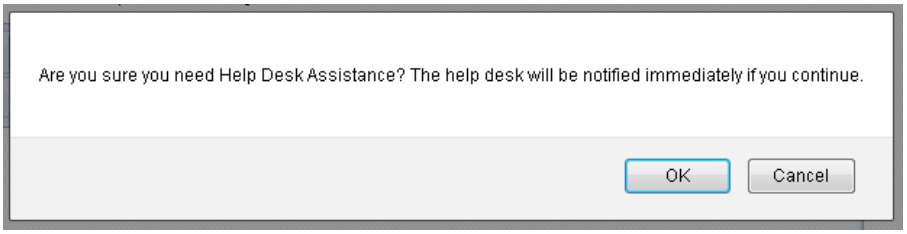

Figure 15. Help Desk Assistance Required Confirmation box

Resolution – (Required) Describe the final resolution of the issue, including repaired/replaced components.

Important: If the issue was resolved with Help Desk assistance (and the "Help Desk Assistance Required" checkbox above is checked), the Local Maintenance Provider should use this box to capture actions that were undertaken to resolve the issue with Help Desk support.

Date Resolved –Enter the date/time that the issue was finally resolved. The format for this date field is YYYY-MM-DD where:

- YYYY – four digit year
- MM – two digit month
- DD – two digit day

Service Request # – If the issue is related to an existing SLD Help Desk Service Request, enter the Service Request number. If there is no existing Service Request, leave this field blank.

Issue Level 1 – (Required) Select the Issue Category that applies to this issue. A detailed list of Issue Categories/Subcategories is included in Appendix A of this document.

Issue Level 2 – (Required) Select the Issue Subcategory that applies to this issue. The contents of this list are dependent upon the selection of the Issue Category above. A detailed list of Issue Categories/Subcategories is included in Appendix A of this document.

Issue Level 3 – Select the Issue Subcategory that applies to this issue. The contents of this list are dependent upon the selection of the Issue Subcategory1 above. A detailed list of Issue Categories/Subcategories is included in Appendix A of this document.

Issue Level 4 – Select the Issue Subcategory that applies to this issue. The contents of this list are dependent upon the selection of the Issue Subcategory2 above. A detailed list of Issue Categories/Subcategories is included in Appendix A of this document.

Repair Cost – Upon completion of work, the Local Maintenance Provider should populate the cost that will be invoiced for the repair work.

Attachments – The attachments field allows the Local Maintenance Provider to attach additional documentation related to the reported Issue.

Important: Attached files ***cannot*** be used in place of completing fields in the report forms.

Important: File attachments in the Maintenance Reports ***do not*** fulfill the Local Maintenance Provider requirement to upload "daily files" or perform other file archiving. Local Maintenance Providers must continue to submit these files as required by their contract via the ORNL secure upload site.

RPM Parameters Changed – Check this box if the RPM settings have been changed. A Functional Test Compliance Report (FCTR form) documenting the change should be attached.

2.2 Parts and Materials Used (Section)

This section is intended to capture whether parts were used to resolve the issue, what parts were used, and whether the Local Maintenance Provider requires replenishment for the consumed parts.

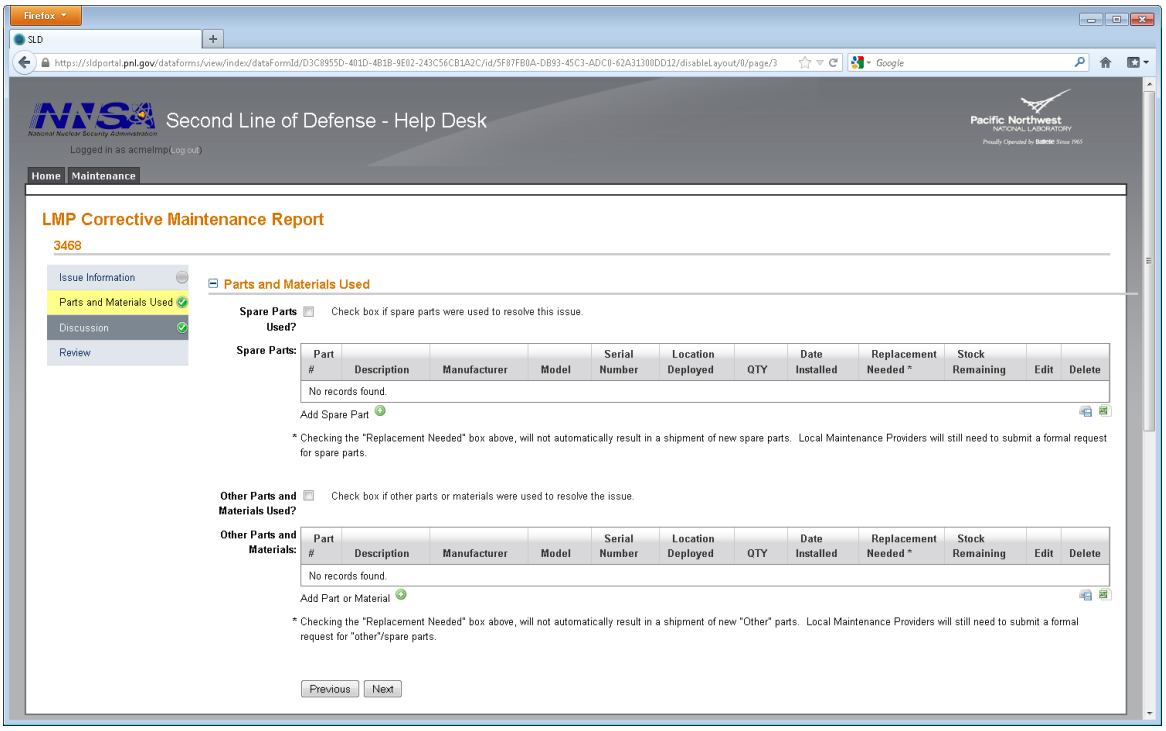

Figure 16. Corrective Maintenance Report: Parts and Materials Used Section

Spare Parts Used? – This checkbox should be checked if parts were used from the Local Maintenance Provider's spare parts inventory.

Spare Parts – The Local Maintenance Provider will use the fields in this table to identify parts used from their spare parts inventory. Additional rows can be added or removed as needed. Subsequent sections describe each field in the table.

Part# – Provide the part number in this field.

Description – Enter a description of the part in this field.

Manufacturer – Provide the name of the part's manufacturer.

Model – Enter the model number of the replaced part.

Serial Number – If the part has a serial number, enter the serial number of the spare part used to replace the failing component.

Location Deployed – Briefly describe the location where the replacement parts were deployed.

QTY – List the quantity of this part that was used to resolve this issue.

Date Installed – Date/time the part was used. The format for this date field is YYYY-MM-DD where:

- YYYY – four digit year
- MM – two digit month
- DD – two digit day

Replacement Needed – The Local Maintenance Provider can check this box to indicate that this part will need to be replenished in their spare parts inventory.

Important: Checking the "Replacement Needed" box will not automatically result in a shipment of new spare parts. Local Maintenance Providers will still need to submit a formal request for spare parts following the Sustainability Manager's guidance.

Stock Remaining – The Local Maintenance Provider reports how many of the identified part is remaining in their spare parts inventory.

Other Parts and Materials Used? – This checkbox should be checked if parts or other materials that were not part of the Local Maintenance Provider's spare parts inventory.

Other Parts and Materials – The Local Maintenance Provider will use the fields in this table to identify parts that were not part of the spare parts inventory. Additional rows can be added or removed as needed. Subsequent sections describe each field in the table.

Part# – Provide the part number in this field.

Description – Enter a description of the part in this field.

Manufacturer – Provide the name of the part's manufacturer.

Model – Enter the model number of the replaced part.

Serial Number – If the part has a serial number, enter the serial number of the spare part used to replace the failing component.

Location Deployed – Briefly describe the location where the replacement parts were deployed.

QTY – List the quantity of this part that was used to resolve this issue.

Date Installed – Date/time the part was used. The format for this date field is YYYY-MM-DD where:

- YYYY – four digit year
- MM – two digit month
- DD – two digit day

2.3 Discussion (Section)

The Discussion Section was added to facilitate secure communications between the Local Maintenance Provider, Sustainability Managers, Service Request Managers, and Vendors. Sustainability Managers may use this section to provide guidance to LMPs, authorize site visits, or request additional information.

If the Local Maintenance Provider checks the "Help Desk Assistance Required" box, a Help Desk Service Request will be created. The Help Desk will assign a Service Request Manager (SRM) based upon the problem described in the Corrective Maintenance Report and the SRM will provide additional guidance and questions via the discussion tab in the report. If needed, the SRM can also add a Vendor to the discussion to provide additional assistance. The discussion history is displayed in a scroll-able window with a text box below it for the user to add text; similar to an instant messaging/chat tool.

A notification feature (not shown) has been included to facilitate faster communication. Email notifications that someone has added to the discussion will only be sent to subscribed users and the LMP when the "notify" button is pressed. By default, the Local Maintenance Provider will receive notifications whenever a user clicks the "notify" button on the discussion tab. Other users can click the "Subscribe" to add or remove themselves from the distribution list. This notification email will indicate that an update to the discussion for a specific Corrective Maintenance Report has been entered. A link to the report and the report number will also be included. Users can then login to the SLD Portal to securely view the discussion history.

> ***Important:*** LMPs and Vendors should avoid entering any labor/cost information into the discussion, since the discussion can be viewed by all entities with access to the CMR.

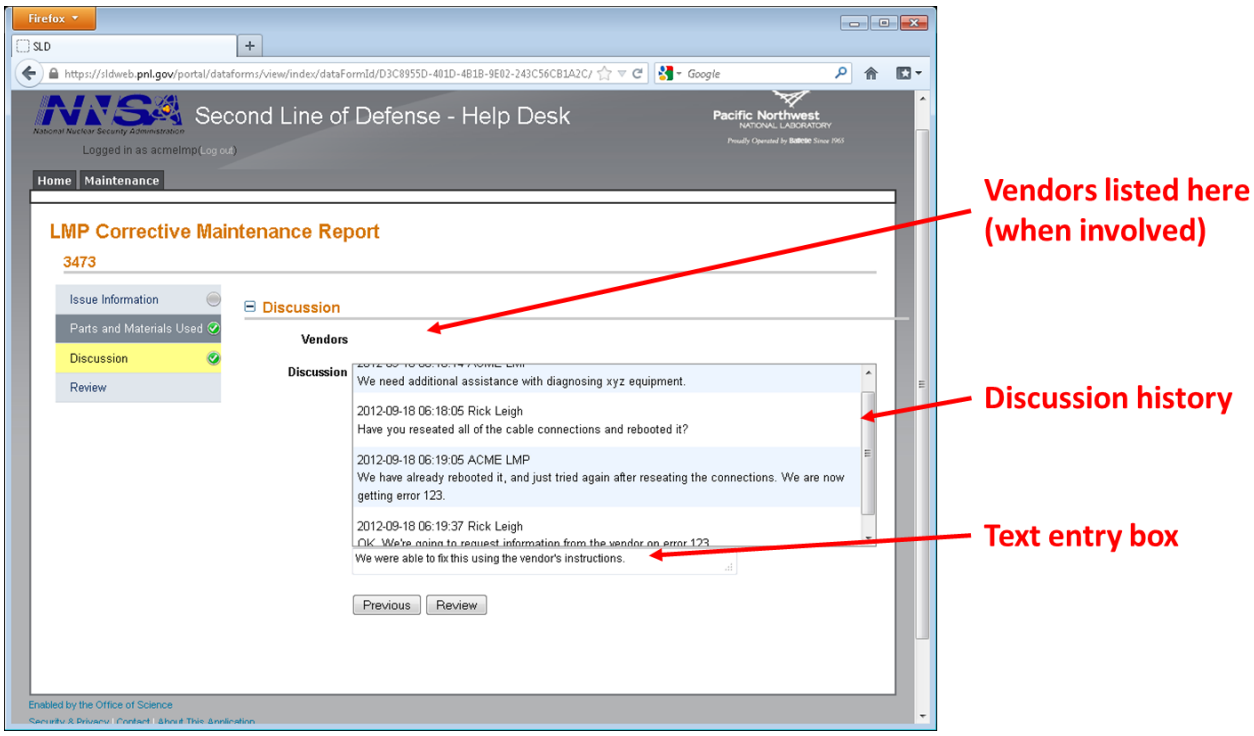

Figure 17. Discussion Tab Features

If pictures/screenshots/ instruction documents need to be sent between the LMP, SRM, and/or Vendor, they can be attached in the Issue Information Section and referenced in the discussion.

2.4 Review (Section)

The Review Section displays all of the information entered on a single read-only form that can be easily reviewed and printed prior to completion.

> ***Important:*** Once a Maintenance Report Form is marked complete, it will no longer appear in the Local Maintenance Provider's list of in-progress reports. While it will be available under either the "Uncertified Completed" or "Certified Completed" tabs within the Corrective Maintenance Report Summary table, it will not be editable.

Sections on the review screen can be expanded or collapsed using the "+" and "-" buttons or the "Expand All"/"Collapse All" buttons at the top of the screen.

If changes need to be made to one of the previous sections, the user can navigate to the related section using the menu on the left side of the screen to return to the desired section or by selecting the "previous" button to be returned to the "Parts and Materials Used" section.

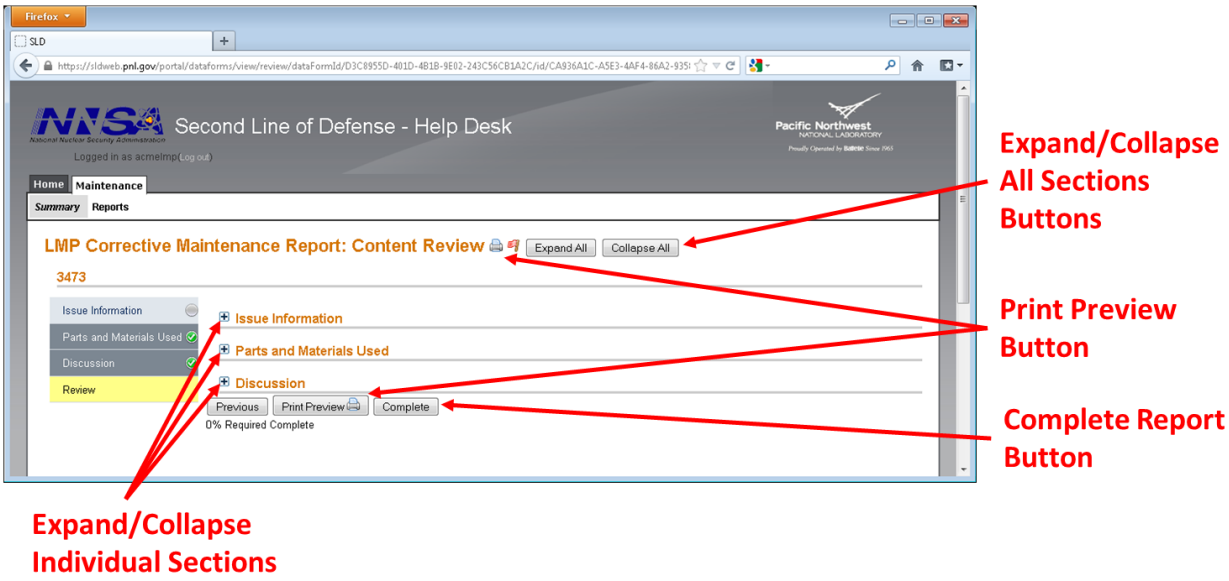

Figure 18. Content Review Screen Features

2.4.1 Printing/Saving a copy of the report prior to Completion

To print or save a copy of the report prior to marking it complete, the user can click one of two "Print Preview" buttons on the screen, as indicated in the Figure below. This will open a new window with a copy of the report that is formatted for printing.

2.4.1.1 Print the Report

To print the page, select "Print…" from the "File" menu within the browser or click the printer icon in the toolbar. In most browsers, the report can also be printed by pressing "Ctrl-P" on the keyboard.

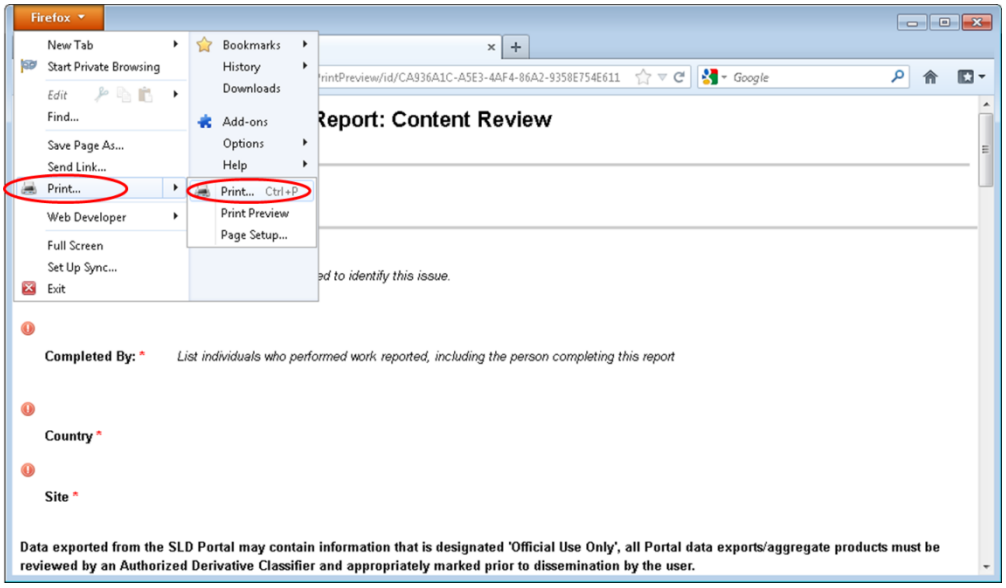

Figure 19. Printing a Report

2.4.1.2 Save the Report

To save an electronic copy of the report, select "Save Page As…" from the "File" menu within the browser.

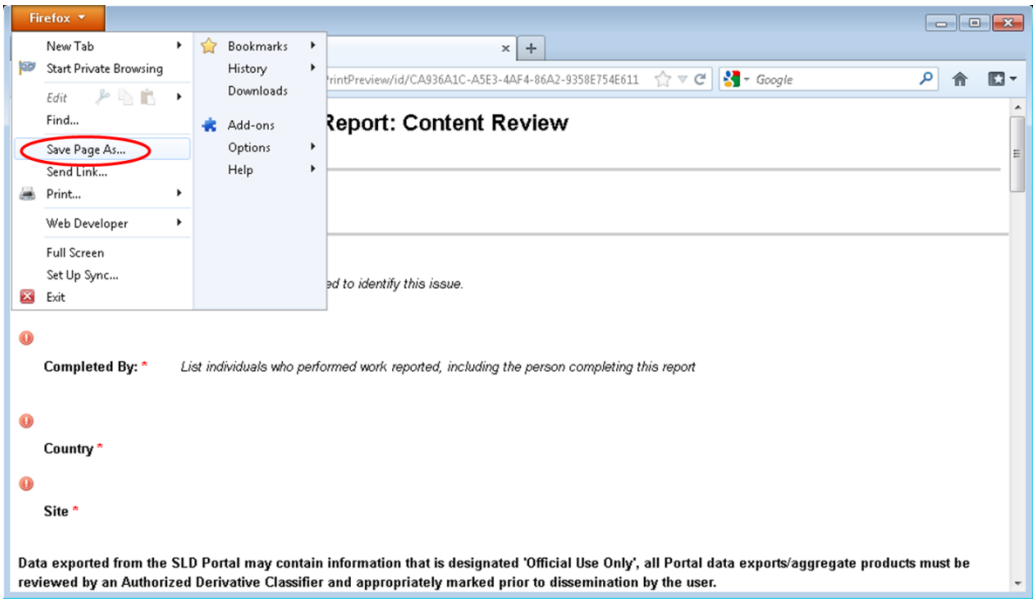

Figure 20. Saving a Report

Enter the desired filename, select the preferred file type, and click "Save".

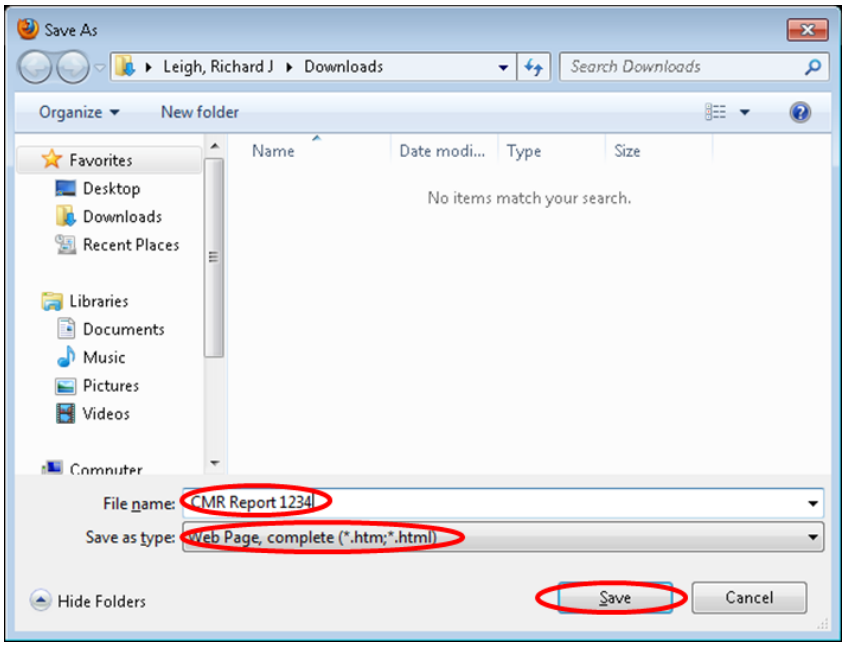

Figure 21. Naming the File

2.4.2 Completing the Report

Once the Local Maintenance Provider has reviewed their report, they can select the "Complete" button at the bottom of the Content Review page to submit their report to the Sustainability Manager for review. A confirmation dialogue box will appear. ***The report will not be editable once completed***. Click "OK" to mark the report complete for review by the Sustainability Manager; click "Cancel" to return to the form without completing it.

2.5 Sustainability Manager Content Review

After the Maintenance Report Form has been marked complete by the Local Maintenance Provider, the Sustainability Manager will review the report. The Sustainability Manager will either "Certify" the report as received or "Un-Complete" the report.

If a Sustainability Manager marks a Maintenance Report "Un-Complete", there is an option to include a note about the reason for un-completing the report. This note is visible to the Local Maintenance Provider along with the uncompleted report to facilitate revision. The un-completed report appears in the Local Maintenance Provider's list of in-progress reports. The Local Maintenance Provider can then edit the form to provide the information requested by the Sustainability Manager and then "Complete" the report again.

3.0 Maintenance Status Report

The Maintenance Status Report is intended to capture preventative maintenance data from regularly scheduled Local Maintenance Provider visits to sites; recognizing that these scheduled visits may not be conducted at the same interval for all sites/countries. All preventative maintenance activities/checklists should be included in the Maintenance Status Report. In addition, the Maintenance Status Report should provide a listing of all Corrective Maintenance Reports filed during that month.

3.1 Background Information (Section)

This section is designed to capture basic information about the Maintenance Status Report, including who performed the work, contact information for the Local Maintenance Provider, and the start date/end date for the reporting period.

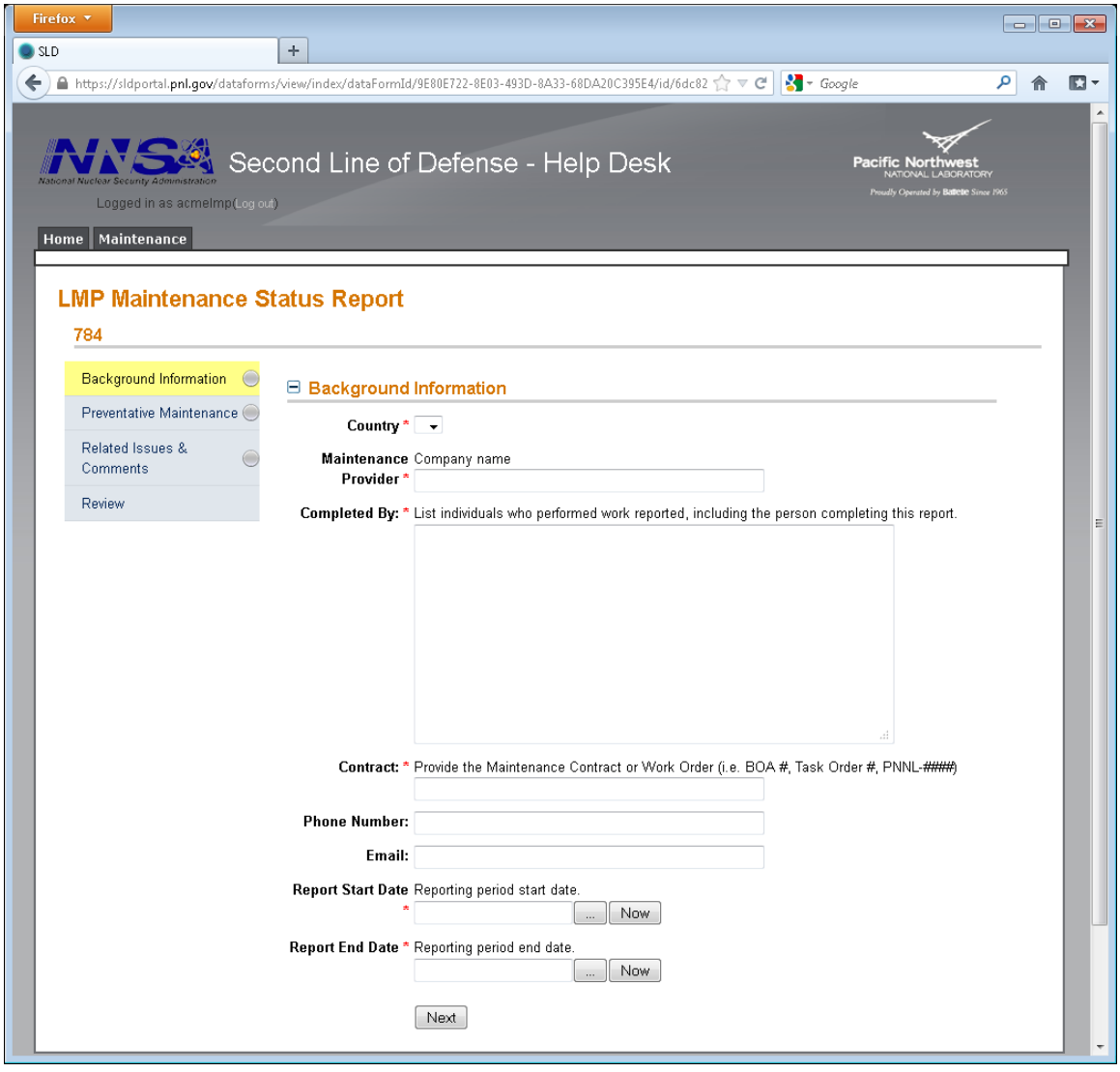

Figure 22. Maintenance Status Report Background Information Section

Country – (Required) Select the Country where the site is located from the dropdown list provided.

Maintenance Provider – (Required) Provide the name of the Local Maintenance Provider.

Completed By – (Required) This field is intended to capture the names of the individuals who completed preventative maintenance work during the reporting period. This includes the technicians that visited the site and the person completing the report. The role of each person included should also be provided.

Contract – Provide the Contract, Basic Order Agreement, or other unique identifier associated with the Local Maintenance Provider's support agreement.

Phone Number – Enter the Local Maintenance Provider's business phone number.

Email – Enter the Local Maintenance Provider's business Email address.

Report Start Date – (Required) Provide the start date for the reporting period. The format for this date field is YYYY-MM-DD where:

- YYYY – four digit year
- MM – two digit month
- DD – two digit day

Report End Date – (Required) Provide the end date for the reporting period. The format for this date field is YYYY-MM-DD where:

- YYYY – four digit year
- MM – two digit month
- DD – two digit day

3.2 Preventative Maintenance (Section)

Preventative Maintenance information is captured at the site-level within the report and the form allows the user to add multiple sites to a single report. By default the Site Specific Information sub-sections are collapsed. The "+" button next to "Site Specific Information" heading can be clicked to expand the subsection, revealing the fields described in this section. Additional sites can be added to the report and may be removed if a mistake is made.

Figure 23. Site Specific Information Options

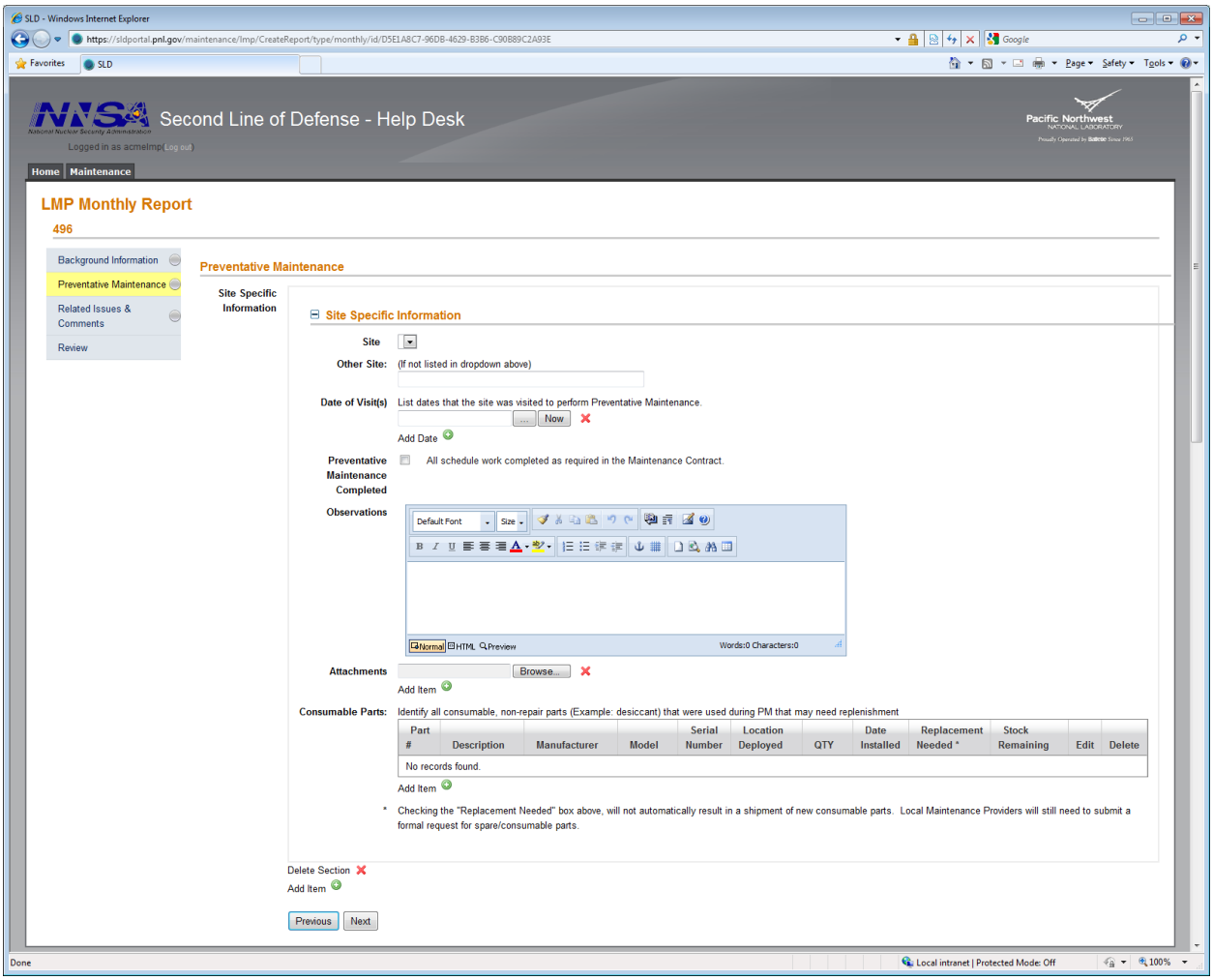

Figure 24. Maintenance Status Report Preventative Maintenance Section

Site – (Required) A dropdown list of sites serviced by the Local Maintenance Provider. Select the site/location, ensuring that the correct crossing type is selected (i.e. vehicle crossing (VC), rail crossing (RC), or Airport (AP)). If the issue affects multiple sites (spare parts requests) the "Country-Wide" (CW) site can be chosen. If the correct site is not represented in the dropdown list, contact the SLD Help Desk to request assistance.

Other Site - If the Site does not appear in the list above, type the name of the Site in this field; otherwise, leave this field blank.

Date of Visit(s) – This field captures the dates that the site was visited for preventative maintenance. Additional dates can be added if multiple visits were made to complete all preventative maintenance activities. . The format for this date field is YYYY-MM-DD where:

- YYYY – four digit year
- MM – two digit month
- DD – two digit day

Preventative Maintenance Completed – This checkbox provides a simple mechanism for the Local Maintenance Provider to indicate that they completed all Preventative Maintenance, including any checklists, as required by the maintenance contract. Local Maintenance Providers should attach any completed checklists using the attachments option described below.

Observations – This field captures site-specific observations made during the preventative maintenance visit(s).

Attachments – The attachments field allows the Local Maintenance Provider to attach additional documentation related to the preventative maintenance visit, such as Contract Appendices Checklists, photos, etc..

Important: Attached files ***cannot*** be used in place of completing fields in the report forms.

Important: File attachments in the Maintenance Reports ***do not*** fulfill the Local Maintenance Provider requirement to upload "daily files" or perform other file archiving. Local Maintenance Providers must continue to submit these files as required by their contract via the ORNL secure upload site.

Consumable Parts – The Local Maintenance Provider will use the fields in this table to identify consumable parts, such as desiccant, that were used during preventative maintenance visit. Equipment parts that are replaced to repair/return a system to operation should be documented in a separate Corrective Maintenance Report form. Additional rows can be added or removed as needed. Subsequent sections describe each field in the table.

Part# – Provide the part number in this field.

Description – Enter a description of the part in this field.

Manufacturer – Provide the name of the part's manufacturer.

Model – Enter the model number of the replaced part.

Serial Number – If the part has a serial number, enter the serial number of the spare part used to replace the failing component.

Location Deployed – Briefly describe the location where the replacement parts were deployed.

QTY – List the quantity of this part that was used to resolve this issue.

Date Installed – Date/time the part was used. The format for this date field is YYYY-MM-DD where:

- YYYY – four digit year
- MM – two digit month

- DD – two digit day

Replacement Needed – The Local Maintenance Provider can check this box to indicate that this part will need to be replenished in their spare parts inventory.

Important: Checking the "Replacement Needed" box will not automatically result in a shipment of new spare parts. Local Maintenance Providers will still need to submit a formal request for spare parts following the Sustainability Manager's guidance.

Stock Remaining – The Local Maintenance Provider reports how many of the identified part is remaining in their spare parts inventory.

3.3 Related Issues & Comments (Section)

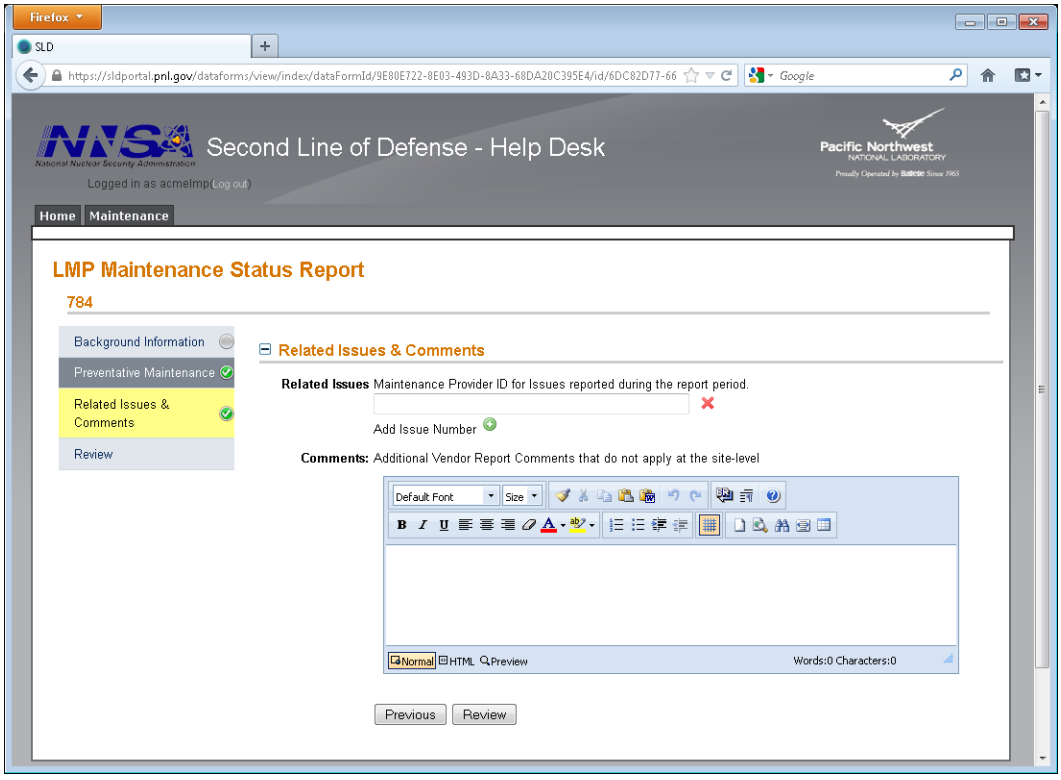

Figure 25. Monthly Reports: Related Issues and Comments Section

Related Issues – This field allows the Local Maintenance Provider to add a reference to one or more Corrective Maintenance Reports into the Maintenance Status Report. The reference should be the number of the Corrective Maintenance Report with other identifying text, such as site name, date, or the Local Maintenance Provider's tracking number.

Comments – Additional Vendor Report Comments that do not apply at the site-level.

3.4 Review (Section)

The Content Review Section displays all of the information entered on a single read-only form that can be easily reviewed and printed prior to completion.

Important: Once a Maintenance Status Report form is marked complete, it will no longer appear in the Local Maintenance Provider's list of in-progress reports.

Sections on the review screen can be expanded or collapsed using the "+" and "-" buttons or the "Expand All"/"Collapse All" buttons at the top of the screen.

If changes need to be made to one of the previous sections, the user can navigate to the related section using the menu on the left side of the screen to return to the desired section or by selecting the "previous" button to be returned to the "Related Issues & Comments" section.

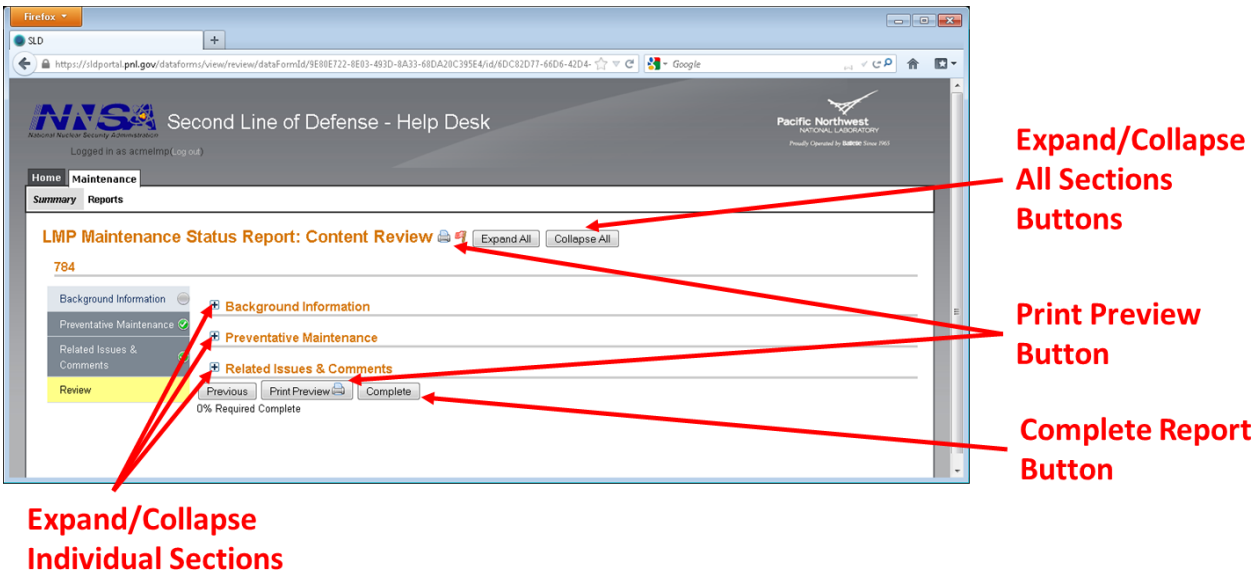

Figure 26. Content Review Screen Features

3.4.1 Printing/Saving a copy of the report prior to Completion

To print or save a copy of the report prior to marking it complete, the user can click one of two "Print Preview" buttons on the screen, as indicated in the Figure below. This will open a new window with a copy of the report that is formatted for printing.

3.4.1.1 Print the Report

To print the page, select "Print…" from the "File" menu within the browser or click the printer icon in the toolbar. In most browsers, the report can also be printed by pressing "Ctrl-P" on the keyboard.

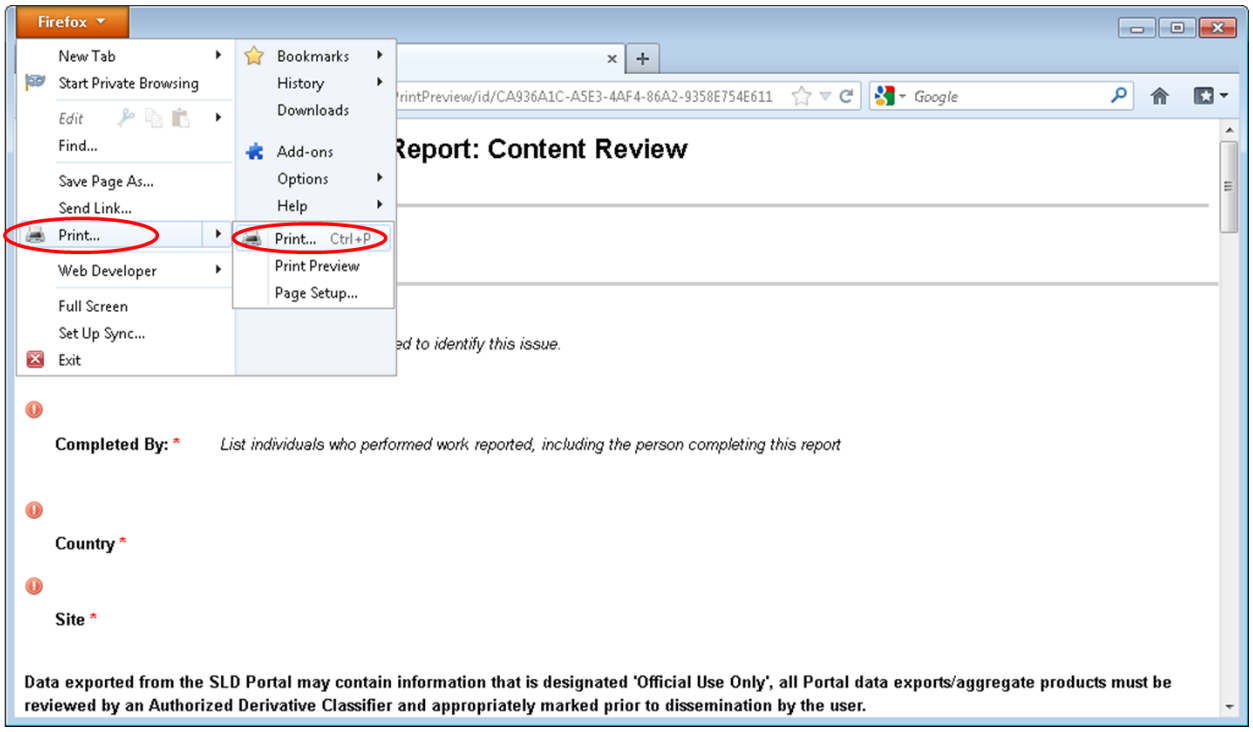

Figure 27. Printing a Report

3.4.1.2 Save the Report

To save an electronic copy of the report, select "Save As…" from the "File" menu within the browser.

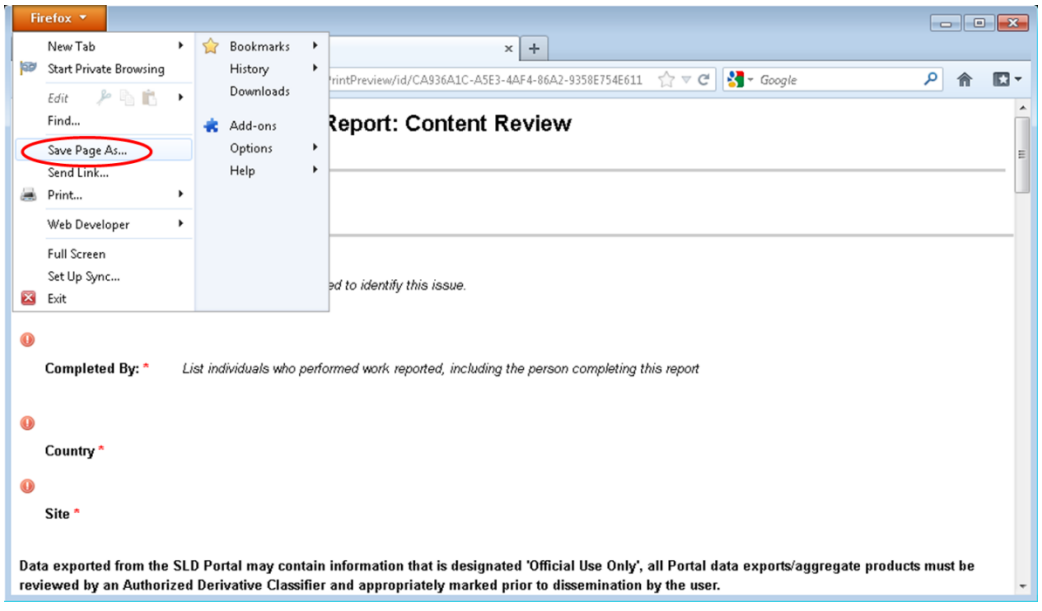

Figure 28. Saving a Report before Completion

Enter the desired filename, select the preferred file type, and click "Save".

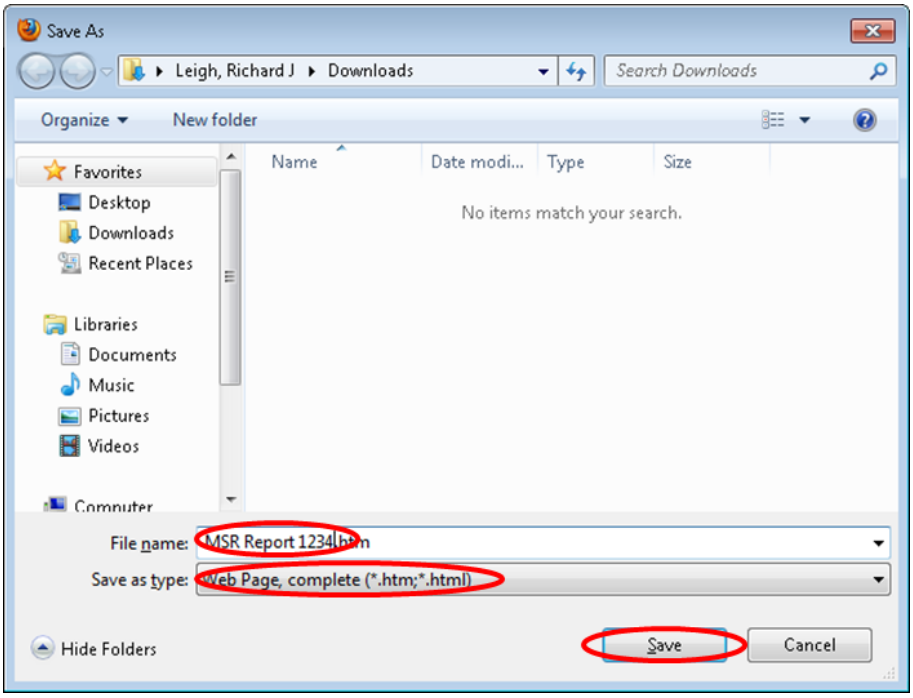

Figure 29. Naming the File

3.4.2 Completing the Report

Once the Local Maintenance Provider has reviewed their report, they can select the "Complete" button at the bottom of the Content Review page to submit their report to the Sustainability Manager for review. A confirmation dialogue box will appear. ***The report will not be editable once completed***. Click "OK" to mark the report complete for review by the Sustainability Manager; click "Cancel" to return to the form without completing it.

3.5 Sustainability Manager Content Review

After the Maintenance Status Report form has been marked complete by the Local Maintenance Provider, the Sustainability Manager will review the report. The Sustainability Manager will either "Certify" the report as received or "Un-Complete" the report.

If a Sustainability Manager marks a Maintenance Status Report "Un-Complete", there is an option to include a note about the reason for un-completing the report. This note is visible to the Local Maintenance Provider along with the uncompleted report to facilitate revision. The un-completed report appears in the Local Maintenance Provider's list of in-progress reports. The Local Maintenance Provider can then edit the form to provide the information requested by the Sustainability Manager and then "Complete" the report again.

Appendix A. Issue Resolution Categories

(Revised September, 2012)

1. Fixed Detector
   a. RPM (Radiation Portal Monitor)
      i. Gamma Detector
      ii. Neutron Detector
      iii. Occupancy Sensor
      iv. Power Supply
      v. Battery Backup
         1. Battery
         2. Charger
      vi. Electronics/Circuit Boards
      vii. Breakers/Fuses
      viii. Alarm Indicator
      ix. Internal Wiring/Connectors
      x. Enclosure
      xi. Software/Firmware
      xii. Parameter Settings
      xiii. Other Hardware
   b. SPM (Spectroscopic Portal Monitor)
      i. Gamma Detector
      ii. Neutron Detector
      iii. Occupancy Sensor
      iv. Power Supply
      v. Battery Backup
         1. Battery
         2. Charger
      vi. Internal Computer
      vii. Electronics/Circuit Boards
      viii. Breakers/Fuses
      ix. Alarm Indicator
      x. Internal Wiring/Connectors
      xi. Enclosure
      xii. Software/Firmware
      xiii. Parameter Settings
      xiv. Other Hardware
2. Mobile Detector
   a. MDS (Mobile Detection System)
      i. Gamma Detector
      ii. Neutron Detector
      iii. Occupancy Sensor
      iv. Power Supply
      v. Battery Backup
         1. Battery
         2. Charger
      vi. Alarm Workstation
         1. Hardware
         2. Software
      vii. Printer

viii. Video System
ix. Data/Network Hardware
x. Illuminators
xi. Electronics/Circuit Boards
xii. Breakers/Fuses
xiii. Alarm Panel
xiv. Internal Wiring/Connectors
xv. Software/Firmware
xvi. Parameter Settings
xvii. Vehicle
xviii. Other Hardware

b. MRDIS (Mobile Radiation Detection and Identification System)
   i. RPM (Radiation Portal Monitor)
      1. Gamma Detector
      2. Neutron Detector
      3. Occupancy Sensor
      4. Power Supply
      5. Battery Backup
      6. Electronics/Circuit Boards
      7. Breakers/Fuses
      8. Alarm Indicator
      9. Internal Wiring/Connectors
      10. Enclosure
      11. Software/Firmware
      12. Parameter Settings
      13. Other Hardware
   ii. SPM (Spectroscopic Portal Monitor)
      1. Gamma Detector
      2. Neutron Detector
      3. Occupancy Sensor
      4. Power Supply
      5. Battery Backup
      6. Internal Computer
      7. Electronics/Circuit Boards
      8. Breakers/Fuses
      9. Alarm Indicator
      10. Internal Wiring/Connectors
      11. Enclosure
      12. Software/Firmware
      13. Parameter Settings
      14. Other Hardware
   iii. Systems Electrical Generator
   iv. Drive Electrical Generator
   v. Shore Power Trailer/ATS
   vi. Power Distribution
   vii. Breakers/Fuses
   viii. UPS
      1. Battery
      2. Charger
   ix. OCR System
      1. Computer

2. Occupancy Sensor
3. Camera

x. Operator Workstation
1. Hardware
2. Software.

xi. Electronics/Circuit Boards

xii. Network/Wireless

xiii. Illumination

xiv. Traffic Control
1. Message Board
2. Speed Indicator
3. Traffic Light

xv. Internal Wiring/Connectors

xvi. Equipment Panels/Enclosures

xvii. Chassis/Operator Cabin

xviii. Vehicle Drive System

xix. Other hardware

c. Straddle Carrier

i. Primary Detector
1. Gamma Detector
2. Neutron Detector
3. Occupancy Sensor
4. Power Supply
5. Battery Backup
6. Internal Computer
7. Electronics/Circuit Boards
8. Breakers/Fuses
9. Alarm Indicator
10. Internal Wiring/Connectors
11. Enclosure
12. Software/Firmware
13. Parameter Settings
14. Other Hardware

ii. Secondary Detector
1. Gamma Detector
2. Neutron Detector
3. Occupancy Sensor
4. Power Supply
5. Battery Backup
6. Internal Computer
7. Electronics/Circuit Boards
8. Breakers/Fuses
9. Alarm Indicator
10. Internal Wiring/Connectors
11. Enclosure
12. Software/Firmware
13. Parameter Settings
14. Other Hardware

iii. Occupancy Sensor

iv. Electrical Generator

v. UPS
    1. Battery
    2. Charger
vi. Breakers/Fuses
vii. OCR System
viii. GPS System
ix. Operator Workstation
    1. Hardware
    2. Software
x. Electronics/Circuit Boards
xi. Illumination
xii. Internal Wiring/Connectors
xiii. Equipment Panels/Enclosures
xiv. Chassis/Operator Cabin
xv. Vehicle Drive System
xvi. Software/Firmware
xvii. Parameter Settings
xviii. Other Hardware

3. Handheld Detectors
    a. PRD (Personal Radiation Detector)
        i. Detector
        ii. Battery
    b. Survey Meter
        i. Detector
        ii. Battery
        iii. Charging base
    c. RIID (Radioactive Isotope Identification Device)
        i. Detector
        ii. Battery
        iii. Charging base
    d. High Resolution (RIID)
        i. Detector
        ii. Battery
        iii. Charging base
4. Central Alarm Station (System)
    a. Server
        i. Hardware
            1. Hard drive
            2. Attached data storage
            3. Power supply
            4. Network card
            5. Monitor
            6. Keyboard
            7. Mouse
            8. Other
        ii. Software
            1. Operating System
            2. Antivirus
            3. Archiving
            4. Server (DB mgmt)
        iii. Administrative

1. User access
2. Configuration settings
3. Data management

b. Workstation
   i. Hardware
      1. Hard drive
      2. Power supply
      3. Network card
      4. Monitor
      5. Keyboard
      6. Mouse
      7. Other
   ii. Software
      1. Operating System
      2. Client (DB mgmt)
      3. Antivirus
      4. Detection
      5. Archiving
   iii. Administrative
      1. User access
      2. Configuration settings
      3. Data management

c. Printer
   i. Cartridge
   ii. Other hardware

d. VoIP Telephone
   i. Hardware
   ii. Software

e. Other

5. Network
   a. Router
   b. Ethernet switch
   c. Media converter
   d. Wireless
   e. Cabling/Connectors
      i. Copper
      ii. Fiber
   f. Network surge protection device
   g. External network/telecom services
   h. VPN end point
   i. Other
6. NCS
7. (OCR) Optical Character Recognition
   a. Server
      i. Hardware
         1. Hard drive
         2. Attached data storage
         3. Power supply
         4. Network card
         5. Monitor
         6. Keyboard

7. Mouse
8. Other

ii. Software
1. Operating System
2. Antivirus
3. Archiving
4. Server (DB mgmt)

iii. Administrative
1. User access
2. Data management

b. OCR Lane Computer

i. Hardware
1. Hard drive
2. Power supply
3. Network card
4. Monitor
5. Keyboard
6. Mouse
7. Other

ii. Software
1. Operating System
2. Client (DB mgmt)
3. Antivirus
4. Archiving
5. OCR

iii. Administrative
1. User access
2. Data management

c. Cameras

i. Camera
ii. Housing
iii. Mounting
iv. Power supply
v. Fuses
vi. Heater
vii. Illuminator

d. Occupancy sensors
e. Other

8. LPR (License Plate Reader)

a. Server

i. Hardware
1. Hard drive
2. Power supply
3. Network card
4. Monitor
5. Keyboard
6. Mouse
7. Other

ii. Software
1. Operating System
2. Antivirus

3. Archiving
4. Server (DB mgmt)

iii. Administrative

b. LPR Workstation

i. Hardware

1. Hard drive
2. Power supply
3. Network card
4. Monitor
5. Keyboard
6. Mouse
7. Other

ii. Software

1. Operating System
2. Client (DB mgmt)
3. Antivirus
4. Archiving
5. LPR

iii. Administrative

1. User access
2. Data management

c. Cameras

i. Camera
ii. Housing
iii. Mounting
iv. Power supply
v. Fuses
vi. Heater
vii. Illuminator

d. Occupancy sensors
e. Other

9. Lane Camera
   a. Camera
   b. Housing
   c. Mounting
   d. Power supply
   e. Fuses
   f. Heater
   g. Illuminator
   h. Other
10. Power
    a. Off-site(grid) power
    b. On-site generator
    c. Power conditioner
    d. Power circuit breaker
    e. Power surge protection device
    f. Power Cables/Wiring
    g. UPS (Uninterrupted Power Supply)
       i. Batteries
       ii. Other hardware
       iii. Firmware

11. Traffic control
    a. Reader board
    b. Traffic lights
    c. Gate arm
    d. Programmable logic controller (PLC)
    e. Occupancy sensor
    f. Ticket machine
        i. Ticket supply
        ii. Hardware
    g. Speed humps
    h. Bollards
    i. Signage
    j. Other
12. Environmental Control
    a. Air conditioner
    b. Humidity controller
    c. Enclosure heater
    d. Utility panel (enclosure)
13. Miscellaneous Infrastructure
    a. Area lighting
    b. Surveillance camera
        i. Camera
        ii. Housing
        iii. Mounting
        iv. Power supply
        v. Fuses
        vi. Heater
        vii. Illuminator
        viii. DVR
        ix. PTZ control
        x. Other
    c. Other
14. Administrative (**Help Desk Use Only**)
    a. Contracting
    b. Shipping
    c. Accounts payable
    d. Manuals
    e. Media requests
    f. Training
    g. ConOps/Procedures
    h. Documentation issue
    i. Design issue
    j. Parts
        i. Initial Order
        ii. Resupply
        iii. Emergency
    k. Portal administration
    l. Other

Appendix B. Category and Subcategory Definitions

(Revised September 17, 2012)

Below are category and subcategory descriptions. If the category or subcategory is self-explanatory, then no further description is provided.

1. *Fixed Detector* – radiation detection equipment that is mounted in a fixed location and is not readily moveable
    a. *RPM (Radiation Portal Monitor)* – radiation detection equipment typically consisting of two pillars with radiation (gamma and neutron) detector panel(s) on each side, which are remotely monitored from a display panel to screen traffic. The system includes:
        i. *Gamma Detector* – scintillating plastic (PVT) panel with photomultiplier tube attached, Aspect module includes signal discriminator electronics
        ii. *Neutron Detector* – plastic covered tubes containing He-3 gas, Aspect module includes signal discriminator electronics
        iii. *Occupancy Sensor* – the ultrasonic, radar, or infrared technologies used to detect presence of traffic (people, vehicles or containers)
        iv. *Power Supply* – power conversion hardware converting mains (grid) power to lower voltage/direct current for internal electronics, power junction box, power controller
        v. *Battery Backup* – backup energy storage in case site power is lost
            1. *Battery* – energy storage device
            2. *Charger* – hardware to recharge the battery
        vi. *Electronics/Circuit Boards* – all electronic hardware/circuits that perform data acquisition and analysis, user interface to system data, detect electrical pulse from the photomultiplier tube and converts it to a "count", data string communications, signal relays, high voltage control, speed sensor, pillar interconnection box, logic controller, tamper sensor, fault detection
        vii. *Breakers/Fuses* – electrical isolation for power control and abnormal power conditions
        viii. *Alarm Indicator* – indicator lights and/or siren that alerts the operator to an alarm or error status
        ix. *Internal Wiring/Connectors* – cables, conduit, plugs, and connectors for power and signal transfer within the monitor
        x. *Enclosure* – the metal container that surrounds and protects the components of the radiation detectors, pillar-to-pillar interconnection conduit
        xi. *Software/Firmware* – original manufacturer program logic to control monitor and output
        xii. *Parameter Settings* – configurable settings that determine the operation of the portal, including when and how to alert to operator to the presence or radiation or an error state, including communications protocol data (IP address)
        xiii. *Other Hardware* – equipment that is part of the monitor but not listed above
    b. *SPM (Spectroscopic Portal Monitor)* - radiation detection equipment typically consisting of two pillars with radiation (gamma and neutron) detector panel(s) on each side, which are remotely monitored from a display panel to screen traffic. The system includes:
        i. *Gamma Detector* – materials that enable high resolution spectral analysis such as NaI crystals
        ii. *Neutron Detector* – plastic covered tubes containing He-3 gas
        iii. *Occupancy Sensor* – the ultrasonic, radar, or infrared technologies used to detect presence of traffic (people, vehicles or containers)

iv. *Power Supply* – power conversion hardware converting mains (grid) power to lower voltage/direct current for internal electronics, power junction box, power controller
v. *Battery Backup* – backup energy storage in case site power is lost
    1. *Battery* – energy storage device
    2. *Charger* – hardware to recharge the battery
vi. *Internal Computer* – detect signal and processes it into spectra
vii. *Electronics/Circuit Boards* – all electronic hardware/circuits that perform data acquisition and analysis, user interface to system data, detect electrical pulse from the photomultiplier tube and converts it to a "count", data string communications, signal relays, high voltage control, speed sensor, pillar interconnection box, logic controller, tamper sensor, fault detection
viii. *Breakers/Fuses* – electrical isolation for power control and abnormal power conditions
ix. *Alarm Indicator* – indicator lights and/or siren that alerts the operator to an alarm or error status
x. *Internal Wiring/Connectors* – cables, conduit, plugs, and connectors for power and signal transfer within the monitor
xi. *Enclosure* – the metal container that surrounds and protects the components of the radiation detectors
xii. *Software/Firmware* – original manufacturer program logic to control monitor and output
xiii. *Parameter Settings* – configurable settings that determine the operation of the portal, including when and how to alert to operator to the presence or radiation or an error state, including communications protocol data (IP address)
xiv. *Other Hardware* – equipment that is part of the monitor but not listed above

2. *Mobile Detector* - radiation detection equipment that is mobile or can be relocated without changes to fixed infrastructure
    a. *MDS (Mobile Detection System)* – a vehicle, typically a van, retrofitted with radiation detection equipment and alarm system
        i. *Gamma Detector* – scintillating plastic (PVT) panel with photomultiplier tube attached
        ii. *Neutron Detector* – plastic covered tubes containing He-3 gas
        iii. *Occupancy Sensor* – the ultrasonic, radar, or infrared technologies used to detect presence of traffic (people, vehicles or containers)
        iv. *Power Supply* – power conversion hardware converting mains (grid) power to lower voltage/direct current for internal electronics, power junction box, power controller
        v. *Battery Backup* – backup energy storage in case site power is lost
            1. *Battery* – energy storage device
            2. *Charger* – hardware to recharge the battery
        vi. *Alarm Workstation* – the computer used by personnel to monitor/document radiation scans
            1. *Hardware* – electrical and mechanical components of a computer
            2. *Software* – operating system, applications, drivers, and other code/instructions processed by computer hardware to automate the collection, aggregation, and dissemination of information
        vii. *Printer* – device attached to a computer or network for the purpose of producing a paper copy of digital information
        viii. *Video System* – equipment used to capture video or still images of vehicles/people passing the exterior of the van for the purpose of identifying objects that trigger an alarm

ix. *Data/Network Hardware* – hardware specific to the routing of data between two or more devices
x. *Illuminators* – an energy source designed to provide illumination to objects within view of a camera; may be either in the visible or infrared spectrum
xi. *Electronics/Circuit Boards* – electronic hardware/circuits that perform data acquisition and analysis, user interface to system data, detect electrical pulse from the photomultiplier tube and converts it to a "count", data string communications, signal relays, high voltage control, speed sensor, pillar interconnection box, logic controller, tamper sensor, fault detection
xii. *Breakers/Fuses* – electrical isolation for power control and abnormal power conditions
xiii. *Alarm Panel* - indicator lights and/or siren that alerts the operator to an alarm or error status
xiv. *Internal Wiring/Connectors* – cables, conduit, plugs, and connectors for power and signal transfer within the monitor
xv. *Software/Firmware* – original manufacturer program logic to control monitor and output
xvi. *Parameter Settings* – configurable settings that determine the operation of the portal, including when and how to alert to operator to the presence or radiation or an error state, including communications protocol data (IP address)
xvii. *Vehicle* – any equipment associated with the conveyance that is not part of the radiation detection system or supporting equipment; the van.
xviii. *Other Hardware* – equipment that is part of the mobile detector but not listed above

b. *MRDIS (Mobile Radiation Detection and Identification System)* – a self-contained mobile unit that is not a vehicle which includes:
    i. *RPM (Radiation Portal Monitor)* - radiation detection equipment typically consisting of two pillars with radiation (gamma and neutron) detector panel(s) on each side, which are remotely monitored from a display panel to screen traffic. The system includes:
        1. *Gamma Detector* – scintillating plastic (PVT) panel with photomultiplier tube attached
        2. *Neutron Detector* – plastic covered tubes containing He-3 gas
        3. *Occupancy Sensor* – The ultrasonic, radar, or infrared technologies used to detect presence of traffic (people, vehicles or containers)
        4. *Power Supply* – power conversion hardware converting mains (grid) power to lower voltage/direct current for internal electronics, power junction box, power controller
        5. *Battery Backup* – backup energy storage in case site power is lost
        6. *Electronics/Circuit Boards* – electronic hardware/circuits that perform data acquisition and analysis, user interface to system data, detect electrical pulse from the photomultiplier tube and converts it to a "count", data string communications, signal relays, high voltage control, speed sensor, pillar interconnection box, logic controller, tamper sensor, fault detection
        7. *Breakers/Fuses* – electrical isolation for power control and abnormal power conditions
        8. *Alarm Indicator* – indicator lights and/or siren that alerts the operator to an alarm or error status
        9. *Internal Wiring/Connectors* – cables, conduit, plugs, and connectors for power and signal transfer within the monitor

10. *Enclosure* – the metal container that surrounds and protects the components of the radiation detectors
11. *Software/Firmware* – original manufacturer program logic to control monitor and output
12. *Parameter Settings* – configurable settings that determine the operation of the portal, including when and how to alert to operator to the presence or radiation or an error state, including communications protocol data (IP address)
13. *Other Hardware* – equipment that is part of the mobile detector but not listed above

ii. *SPM (Spectroscopic Portal Monitor)* - radiation detection equipment typically consisting of two pillars with radiation (gamma and neutron) detector panel(s) on each side, which are remotely monitored from a display panel to screen traffic. The system includes:

1. *Gamma Detector* – materials that enable high resolution spectral analysis such as NaI crystals
2. *Neutron Detector* – plastic covered tubes containing He-3 gas
3. *Occupancy Sensor* – the ultrasonic, radar, or infrared technologies used to detect presence of traffic (people, vehicles or containers)
4. *Power Supply* – power conversion hardware converting mains (grid) power to lower voltage/direct current for internal electronics, power junction box, power controller
5. *Battery Backup* – backup energy storage in case site power is lost
6. *Internal Computer* – detect signal and processes it into spectra
7. *Electronics/Circuit Boards* – electronic hardware/circuits that perform data acquisition and analysis, user interface to system data, detect electrical pulse from the photomultiplier tube and converts it to a "count", data string communications, signal relays, high voltage control, speed sensor, pillar interconnection box, logic controller, tamper sensor, fault detection
8. *Breakers/Fuses* – electrical isolation for power control and abnormal power conditions
9. *Alarm Indicator* – indicator lights and/or siren that alerts the operator to an alarm or error status
10. *Internal Wiring/Connectors* – cables, conduit, plugs, and connectors for power and signal transfer within the monitor
11. *Enclosure* – the metal container that surrounds and protects the components of the radiation detectors
12. *Software/Firmware* – original manufacturer program logic to control monitor and output
13. *Parameter Settings* – configurable settings that determine the operation of the portal, including when and how to alert to operator to the presence or radiation or an error state, including communications protocol data (IP address)
14. *Other Hardware* – equipment that is part of the mobile detector but not listed above

iii. *Systems Electrical Generator* – on-board electrical generator for powering detection equipment

iv. *Drive Electrical Generator* – on-board generator for powering the MRDIS vehicular drive system

v. *Shore Power Trailer/ATS* – cabling/connectors that allow the MRDIS to operate using site-mains electrical power
vi. *Power Distribution* – electrical panels and switchgear used to route and control power from one or more sources to different devices
vii. *Breakers/Fuses* – electrical isolation for power control and abnormal power conditions
viii. *UPS* – device to provide alternate and temporary power to sensitive electronics when line power is degraded or absent
    1. *Battery* – backup energy storage in case site power is lost
    2. *Charger* – hardware to recharge the battery
ix. *OCR System* – Optical Character Recognition equipment designed to support the identification of containers/vehicles by extracting letters or numbers from images
    1. *Computer* – dedicated computer equipment for processing OCR data
    2. *Occupancy Sensor* – the ultrasonic, radar, or infrared technologies used to detect presence of traffic (people, vehicles or containers)
    3. *Camera* – optical device that captures a digital representation of object or scene
x. *Operator Workstation* – the computer used by personnel to monitor/document radiation scans
    1. *Hardware* – electrical and mechanical components of a computer
    2. *Software* – operating system, applications, drivers, and other code/instructions processed by computer hardware to automate the collection, aggregation, and dissemination of information.
xi. *Electronics/Circuit Boards* – electronic hardware/circuits that perform data acquisition and analysis, user interface to system data, detect electrical pulse from the photomultiplier tube and converts it to a "count", data string communications, signal relays, high voltage control, speed sensor, pillar interconnection box, logic controller, tamper sensor, fault detection
xii. *Network/Wireless* – all communications hardware associated with the handing of data flow from various detection system components (i.e., the transport system for all data bytes)
xiii. *Illumination* – an energy source designed to provide illumination to objects within view of a camera or for safety; may be either in the visible or infrared spectrum
xiv. *Traffic Control* – all devices that assess and control the flow of objects to the RPM, to support safety of equipment and the timely movement of items for scanning
    1. *Message Board* – visual display of messages or icons to vehicle operators to instruct on actions for entry to or exit from RPM scanning
    2. *Speed Indicator* – device providing vehicle speed to drivers entering RPM scanning
    3. *Traffic Light* – provides standard light indicators to vehicle operators to instruct on actions for entry to or exit from RPM scanning
xv. *Internal Wiring/Connectors* – cables, conduit, plugs, and connectors for power and signal transfer within the monitor

xvi. *Equipment Panels/Enclosures* – boxes or other coverings designed to protect equipment/cabling from the elements as well as protect operators from electrical and other hazards
xvii. *Chassis/Operator Cabin* – supporting vehicle structure and/or enclosure for operator to safely control/monitor the MRDIS
xviii. *Vehicle Drive System* – equipment that propels and steers the MRDIS
xix. *Other hardware* – equipment connected to the MRDIS but not listed above

c. *Straddle Carrier* – radiation detection equipment attached to a straddle carrier. The straddle carrier is used to scan shipping containers at port terminals and intermodal yards
    i. *Primary Detector* – category for detection components associated with the primary inspection system on-board the straddle carrier
        1. *Gamma Detector* – materials that enable high resolution spectral analysis such as NaI crystals
        2. *Neutron Detector* – plastic covered tubes containing He-3 gas
        3. *Occupancy Sensor* – the ultrasonic or infrared technologies used to detect presence of traffic (people, vehicles or containers)
        4. *Power Supply* – power conversion hardware converting mains (grid) power to lower voltage/direct current for internal electronics, power junction box, power controller
        5. *Battery Backup* – backup energy storage in case site power is lost
        6. *Internal Computer* – detect signal and processes it into spectra
        7. *Electronics/Circuit Boards* – all electronic hardware/circuits that perform data acquisition and analysis, user interface to system data, detect electrical pulse from the photomultiplier tube and converts it to a "count", etc. for the primary detector
        8. *Breakers/Fuses* – electrical isolation for power control and abnormal power conditions
        9. *Alarm Indicator* – indicator lights and/or siren that alerts the operator to an alarm or error status
        10. *Internal Wiring/Connectors* – cables, conduit, plugs, and connectors for power and signal transfer within the monitor
        11. *Enclosure* – the metal container that surrounds and protects the components of the radiation detectors
        12. *Software/Firmware* – original manufacturer program logic to control monitor and output
        13. *Parameter Settings* – configurable settings that determine the operation of the portal, including when and how to alert to operator to the presence or radiation or an error state
        14. *Other Hardware* – equipment connected to the monitor but not listed above
    ii. *Secondary Detector* – category for detection components associated with the secondary inspection system on-board the straddle carrier
        1. *Gamma Detector* – materials that enable high resolution spectral analysis such as NaI crystals
        2. *Neutron Detector* – plastic covered tubes containing He-3 gas
        3. *Occupancy Sensor* – the ultrasonic or infrared technologies used to detect presence of traffic (people, vehicles or containers)
        4. *Power Supply* – power conversion hardware converting mains (grid) power to lower voltage/direct current for internal electronics, power junction box, power controller
        5. *Battery Backup* – backup energy storage in case site power is lost

6. *Internal Computer* – detect signal and processes it into spectra
7. *Electronics/Circuit Boards* – all electronic hardware/circuits that perform data acquisition and analysis, user interface to system data, detect electrical pulse from the photomultiplier tube and converts it to a "count", etc. for the secondary detector
8. *Breakers/Fuses* – electrical isolation for power control and abnormal power conditions
9. *Alarm Indicator* – indicator lights and/or siren that alerts the operator to an alarm or error status
10. *Internal Wiring/Connectors* – cables, conduit, plugs, and connectors for power and signal transfer within the monitor
11. *Enclosure* – the metal container that surrounds and protects the components of the radiation detectors
12. *Software/Firmware* – original manufacturer program logic to control monitor and output
13. *Parameter Settings* – configurable settings that determine the operation of the portal, including when and how to alert to operator to the presence or radiation or an error state
14. *Other Hardware* – equipment connected to the monitor but not listed above

iii. *Occupancy Sensor* – the ultrasonic or infrared technologies used to detect presence of traffic (people, vehicles or containers)

iv. *Electrical Generator* – on-board electrical generator

v. *UPS* – Device to provide alternate and temporary power to sensitive electronics when line power is degraded or absent
   1. *Battery* – backup energy storage in case site power is lost
   2. *Charger* – hardware to recharge the battery

vi. *Breakers/Fuses* – electrical isolation for power control and abnormal power conditions

vii. *OCR System* – Optical Character Recognition equipment designed to support the identification of containers/vehicles by extracting letters or numbers from images

viii. *GPS System* – equipment designed to determine a location using the satellite-based Global Positioning System

ix. *Operator Workstation* – a computer or other electronic interface designed to allow the operator to process alarms
   1. *Hardware* – electrical and mechanical components of a computer
   2. *Software* – operating system, applications, drivers, and other code/instructions processed by computer hardware to automate the collection, aggregation, and dissemination of information.

x. *Electronics/Circuit Boards* – electronic components related to the MRDIS operating system; Human Machine Interface (touchscreen), logic boards, and various Input/Output electronics used to control the drive systems, illumination, etc.

xi. *Illumination* – an energy source designed to provide illumination to objects within view of a camera or for safety; may be either in the visible or infrared spectrum

xii. *Internal Wiring/Connectors* – cables, conduit, plugs, and connectors for power and signal transfer within the monitor

xiii. *Equipment Panels/Enclosures* – boxes or other coverings designed to protect equipment/cabling from the elements as well as protect operators from electrical and other hazards
xiv. *Chassis/Operator Cabin*– supporting structure and/or enclosure for operator to safely control/monitor the MRDIS
xv. *Vehicle Drive System* – equipment that propels and steers the MRDIS
xvi. *Software/Firmware* – original manufacturer program logic to control monitor and output
xvii. *Parameter Settings* – configurable settings that determine the operation of the portal, including when and how to alert to operator to the presence or radiation or an error state
xviii. *Other Hardware* – equipment connected to the monitor but not listed above

3. *Handheld Detectors* – portable, light-weight radiation detectors that require little or no permanent infrastructure to operate
    a. *PRD (Personal Radiation Detector)* – a portable/wearable gamma and/or neutron radiation detector, approximately the size of a pager
        i. *Detector* – scintillation detector, electronics, display
        ii. *Battery* – power source for pager, typically AA battery
    b. *Survey Meter* – radiation detection equipment which is more sensitive in gross radiation counts than a PRD or RIID. It is used for searching
        i. *Detector* – scintillation detector, electronics, display, parameter settings
        ii. *Battery* – power source, typically single module composed of multiple batteries
        iii. *Charging base* – connects meter to mains power for charging of batteries
    c. *RIID (Radioactive Isotope Identification Device)* – handheld gamma (Sodium Iodine-NaI) detector, and optionally including a neutron (Helium-3 tube) detector, typically used to locate and identify radioactive material
        i. *Detector* – detectors, electronics, keypad, display, parameter settings
        ii. *Battery* – power source, typically composed of multiple batteries
        iii. *Charging base* – connects meter to mains power for charging of batteries
    d. *High Resolution (RIID)* – handheld gamma detector (typically high purity germanium-HPGe) with high resolution spectra for accurate and reliable radioactive isotope identification
        i. *Detector* - detectors, electronics, keypad, display, parameter settings
        ii. *Battery* - power source, typically composed of multiple batteries
        iii. *Charging base* - connects meter to mains power for charging of batteries and potentially with internal calibration source
4. *Central Alarm Station (System)* – category of computer equipment used to store/process data from the Radiation Detection Systems
    a. *Server* – dedicated computer for storing and providing data to client computers (e.g., workstations)
        i. *Hardware* – electrical and mechanical components of a computer
            1. *Hard drive* – device using either magnetic discs or solid state memory to provide large-scale non-volatile memory for computer systems
            2. *Attached data storage* – supplemental or temporary data storage device such as a portable hard drive, serial attached storage, or external RAID array
            3. *Power supply* – internal power supply converting mains (grid) power to lower voltage/direct current for electronics
            4. *Network card* – component that allows a computer to communicate with other devices on a network

5. *Monitor* – electronic visual display for a computer or other electronic device
6. *Keyboard* – computer input device using human-language characters to enter data and perform functions
7. *Mouse* – a pointing device that uses hand/finger-movements to move a cursor and generate commands which can be understood by a computer
8. *Other* – equipment connected to the server but not listed above

ii. *Software* – operating system, applications, drivers, and other code/instructions processed by computer hardware to automate the collection, aggregation, and dissemination of information.
1. *Operating System* – basic software that allows for the installation of other applications/services on computer hardware (Windows, Linux, etc.)
2. *Antivirus* – software application designed to prevent the introduction of, detect, and remove malicious software from computer systems
3. *Archiving* – specific software used to copy data to another location for the purpose of data transfer/storage
4. *Server (DB mgmt)* – specific software for storing/providing data in relational database structures

iii. *Administrative* – issues relating to the administration of users/services/permissions on the server
1. *User access* – managing access/permissions on a computer system at the user level
2. *Configuration settings* – managing settings associated with the hardware/software of the computer
3. *Data management* – managing the storage and archiving of data stored on a computer system

b. *Workstation* – the computer used by personnel to monitor/document radiation scans
i. *Hardware* – electrical and mechanical components of a computer
1. *Hard drive* – device using either magnetic discs or solid state memory to provide large-scale non-volatile memory for computer systems
2. *Power supply* – internal power supply converting mains (grid) power to lower voltage/direct current for electronics
3. *Network card* – component that allows a computer to communicate with other devices on a network
4. *Monitor* – electronic visual display for a computer or other electronic device
5. *Keyboard* – computer input device using human-language characters to enter data and perform functions
6. *Mouse* – a pointing device that uses hand/finger-movements to move a cursor and generate commands which can be understood by a computer
7. *Other* – equipment connected to the workstation but not listed above

ii. *Software* – operating system, applications, drivers, and other code/instructions processed by computer hardware to automate the collection, aggregation, and dissemination of information.
1. *Operating System* – basic software that allows for the installation of other applications/services on computer hardware (Windows, Linux, etc.)
2. *Client (DB mgmt)* – specific software for interacting with a database server in relational database structures
3. *Antivirus* – software application designed to prevent the introduction of, detect, and remove malicious software from computer systems

4. *Detection* – specific software used as human interface to the detection system
5. *Archiving* - specific software used to copy data to another location for the purpose of data transfer/storage

iii. *Administrative* – issues relating to the administration of users/services/permissions on the workstation
1. *User access* – managing access/permissions on a computer system at the user level
2. *Configuration settings* – managing settings associated with the hardware/software of the computer
3. *Data management* – managing the storage and archiving of data stored on a computer system

c. *Printer* – device attached to a computer or network for the purpose of producing a paper copy of digital information.
i. *Cartridge* – toner or ink cartridge (consumable)
ii. *Other hardware* – equipment associated with the printer but not listed above

d. *VoIP Telephone* – (Voice over Internet Protocol) equipment used to transmit audio signals over a digital network using the Internet Protocol
i. *Hardware* – electrical and mechanical components of the phone, including the handset and receiver
ii. *Software* – software used to convert audio signals in digital information that can be transported over a computer network using the Internet Protocol

e. *Other* – equipment specific to the CAS but not listed above

5. *Network* – all hardware associated with the handing of data flow from various detection system components (i.e., the transport system for all data bytes)
a. *Router* – device that directs packet communications between nodes on a network using a routing table to address data to its intended destination
b. *Ethernet switch* – device that connects multiple segments of a network by switching connections to facilitate communications
c. *Media converter* – a device that repeats/translates one communication media-type or standard to another, such as fiber optical cable to copper-Ethernet
d. *Wireless* – equipment associated with the transmission or reception of electromagnetic waves for communications purposes
e. *Cabling/Connectors* – wiring/terminations for copper/fiber-optical communications
i. *Copper* – electrical wiring/terminations dependent upon the conductive properties of metallic strands for communications of digital signals
ii. *Fiber* – cabling/terminations leveraging the optical properties of one or more glass strands to communicate digital signals over moderate to long distances
f. *Network surge protection device* – equipment designed to protect and isolate devices attached to an extended run of copper network wiring for the purpose of protecting the equipment from transient voltages
g. *External network/telecom services* – network services provided by national/regional telecommunications carriers
h. *VPN end point* – a hardware device that provides authentication, as well as encryption/decryption services on a computer network in order to secure communications
i. *Other* – equipment connected to the network but not listed above

6. *NCS* – computer equipment and software which gathers data at the CAS and displays multiple CAS data streams at another location for situational awareness
7. *(OCR) Optical Character Recognition* - equipment designed to support the identification of containers/vehicles by extracting letters or numbers from images
a. *Server* – dedicated computer that processes images and stores data/OCR output data

i. *Hardware* – electrical and mechanical components of a computer
    1. *Hard drive* – device using either magnetic discs or solid state memory to provide large-scale non-volatile memory for computer systems
    2. *Attached data storage* – supplemental or temporary data storage device such as a portable hard drive, serial attached storage, or external RAID array
    3. *Power supply* – internal power supply converting mains (grid) power to lower voltage/direct current for electronics
    4. *Network card* – component that allows a computer to communicate with other devices on a network
    5. *Monitor* – electronic visual display for a computer or other electronic device
    6. *Keyboard* – computer input device using human-language characters to enter data and perform functions
    7. *Mouse* – a pointing device that uses hand/finger-movements to move a cursor and generate commands which can be understood by a computer
    8. *Other* – equipment connected to the server but not listed above
ii. *Software* – operating system, applications, drivers, and other code/instructions processed by computer hardware to automate the collection, aggregation, and dissemination of information
    1. *Operating System* – basic software that allows for the installation of other applications/services on computer hardware (Windows, Linux, etc.)
    2. *Antivirus* – software application designed to prevent the introduction of, detect, and remove malicious software from computer systems
    3. *Archiving* – specific software used to copy data to another location for the purpose of data transfer/storage
    4. *Server (DB mgmt)* – OCR server software, supporting database platform, and associated tools/utilities
iii. *Administrative* – issues relating to the administration of users/services/permissions on the server
    1. *User access* – managing access/permissions on a computer system at the user level
    2. *Data management* – managing the storage and archiving of data stored on a computer system

b. *OCR Lane Computer* - computer located at, or in proximity to the traffic lane that is designed to collect and transmit OCR/image information to the OCR server
i. *Hardware* – electrical and mechanical components of a computer
    1. *Hard drive* – device using either magnetic discs or solid state memory to provide large-scale non-volatile memory for computer systems
    2. *Power supply* – internal power supply converting mains (grid) power to lower voltage/direct current for electronics
    3. *Network card* – component that allows a computer to communicate with other devices on a network
    4. *Monitor* – electronic visual display for a computer or other electronic device
    5. *Keyboard* – computer input device using human-language characters to enter data and perform functions
    6. *Mouse* – a pointing device that uses hand/finger-movements to move a cursor and generate commands which can be understood by a computer
    7. *Other* – equipment connected to the monitor but not listed above

ii. *Software* – operating system, applications, drivers, and other code/instructions processed by computer hardware to automate the collection, aggregation, and dissemination of information
    1. *Operating System* – basic software that allows for the installation of other applications/services on computer hardware (Windows, Linux, etc.)
    2. *Client (DB mgmt)* – OCR workstation software, supporting database platform/connections, and associated tools/utilities
    3. *Antivirus* – software application designed to prevent the introduction of, detect, and remove malicious software from computer systems
    4. *Archiving* - specific software used to copy data to another location for the purpose of data transfer/storage
    5. *OCR* – Optical Character Recognition equipment designed to support the identification of containers/vehicles by extracting letters or numbers from images
iii. *Administrative* – issues relating to the administration of users/services/permissions on the lane computer
    1. *User access* – managing access/permissions on a computer system at the user level
    2. *Data management* – managing the storage and archiving of data stored on a computer system

c. *Cameras* – category for equipment associated with an digital optical capture device
    i. *Camera* – optical device that captures a digital representation of object or scene
    ii. *Housing* – enclosure to protect camera from environmental damage or tamper
    iii. *Mounting* – equipment to attach the camera or housing to a stationary pole, wall, or ceiling
    iv. *Power supply* – electronics providing input voltage to the camera
    v. *Fuses* – electrical isolation for power control and abnormal power conditions
    vi. *Heater* – environment conditioner for all-weather operation
    vii. *Illuminator* – an energy source designed to provide illumination to objects within view of a camera; may be either in the visible or infrared spectrum
d. *Occupancy sensors* – the ultrasonic, radar, or infrared technologies used to detect presence of traffic (people, vehicles or containers)
e. *Other* – equipment connected to the OCR system but not listed above

8. *LPR (License Plate Reader)* – equipment designed to support the identification of vehicles by extracting letters or numbers from images of the vehicles license plate
    a. *Server* – dedicated computer that processes images and stores data/LPR output data
        i. *Hardware* – electrical and mechanical components of a computer
            1. *Hard drive* – device using either magnetic discs or solid state memory to provide large-scale non-volatile memory for computer systems
            2. *Power supply* – internal power supply converting mains (grid) power to lower voltage/direct current for electronics
            3. *Network card* – component that allows a computer to communicate with other devices on a network
            4. *Monitor* – electronic visual display for a computer or other electronic device
            5. *Keyboard* – computer input device using human-language characters to enter data and perform functions
            6. *Mouse* – a pointing device that uses hand/finger-movements to move a cursor and generate commands which can be understood by a computer
            7. *Other* – equipment connected to the Server Hardware but not listed above

ii. *Software* – operating system, applications, drivers, and other code/instructions processed by computer hardware to automate the collection, aggregation, and dissemination of information.
    1. *Operating System* – basic software that allows for the installation of other applications/services on computer hardware (Windows, Linux, etc.)
    2. *Antivirus* – software application designed to prevent the introduction of, detect, and remove malicious software from computer systems
    3. *Archiving* - specific software used to copy data to another location for the purpose of data transfer/storage
    4. *Server (DB mgmt)* – LPR server software, supporting database platform, and associated tools/utilities
iii. *Administrative* – issues relating to the administration of users/services/permissions on the server

b. *LPR Workstation* – a computer or other electronic interface designed to allow the operator to access information and respond to alarms
    i. *Hardware* – electrical and mechanical components of a computer
        1. *Hard drive* – device using either magnetic discs or solid state memory to provide large-scale non-volatile memory for computer systems
        2. *Power supply* – internal power supply converting mains (grid) power to lower voltage/direct current for electronics
        3. *Network card* – component that allows a computer to communicate with other devices on a network
        4. *Monitor* – electronic visual display for a computer or other electronic device
        5. *Keyboard* – computer input device using human-language characters to enter data and perform functions
        6. *Mouse* – a pointing device that uses hand/finger-movements to move a cursor and generate commands which can be understood by a computer
        7. *Other* – equipment connected to the workstation hardware but not listed above
    ii. *Software* – operating system, applications, drivers, and other code/instructions processed by computer hardware to automate the collection, aggregation, and dissemination of information.
        1. *Operating System* – basic software that allows for the installation of other applications/services on computer hardware (Windows, Linux, etc.)
        2. *Client (DB mgmt)* – LPR workstation software, supporting database platform/connections, and associated tools/utilities
        3. *Antivirus* – software application designed to prevent the introduction of, detect, and remove malicious software from computer systems
        4. *Archiving* – specific software used to copy data to another location for the purpose of data transfer/storage
        5. *LPR* – License Plate Reader equipment designed to support the identification of vehicles by extracting letters or numbers from images of the vehicles license plate
    iii. *Administrative* – issues relating to the administration of users/services/configuration/permissions on the workstation
        1. *User access* – managing access/permissions on a computer system at the user level
        2. *Data management* – managing the storage and archiving of data stored on a computer system

c. *Cameras* – category for equipment associated with an digital optical capture device

i. *Camera* – optical device that captures a digital representation of object or scene
ii. *Housing* – enclosure to protect camera from environmental damage or tamper
iii. *Mounting* – equipment to attach the camera or housing to a stationary pole, wall, or ceiling
iv. *Power supply* – electronics providing input voltage to the camera
v. *Fuses* – electrical isolation for power control and abnormal power conditions
vi. *Heater* – environment conditioner for all-weather operation
vii. *Illuminator* – an energy source designed to provide illumination to objects within view of a camera; may be either in the visible or infrared spectrum

d. *Occupancy sensors* – the ultrasonic, radar, or infrared technologies used to detect presence of traffic (people, vehicles or containers)
e. *Other* – equipment connected to the camera but not listed above

9. *Lane Camera* – enables identification of object, person, vehicle, or container associated with alarm event of the radiation portal monitor by means of video surveillance
    a. *Camera* – optical device that captures a digital representation of object or scene
    b. *Housing* – enclosure to protect camera from environmental damage or tamper
    c. *Mounting* – equipment to attach the camera or housing to a stationary pole, wall, or ceiling
    d. *Power supply* – electronics providing input voltage to the camera
    e. *Fuses* – electrical isolation for power control and abnormal power conditions
    f. *Heater* – environment conditioner for all-weather operation
    g. *Illuminator* – an energy source designed to provide illumination to objects within view of a camera; may be either in the visible or infrared spectrum
    h. *Other* – equipment connected to the camera but not listed above
10. *Power* – equipment associated with the transmission, generation, or management of electrical power at a site
    a. *Off-site(grid) power* – electrical power supplied by local utility company
    b. *On-site generator* – provides locally generated AC line power to SLD RPMs and ancillary components
    c. *Power conditioner* – provides voltage regulation/conditioning to deliver stable electrical power
    d. *Power circuit breaker* – electrical isolation for power control and abnormal power conditions
    e. *Power surge protection device* – provides control of extreme surges of electrical power to avert damage to equipment (e.g., TVSS)
    f. *Power Cables/Wiring* – infrastructure wiring/cables for power transmission; does not include common extension cords. Umbilical cables for mobile equipment should be categorized within the category for mobile equipment
    g. *UPS (Uninterrupted Power Supply)* – device to provide alternate and temporary power to sensitive electronics when line power is degraded or absent
        i. *Batteries* – charge storage component within the UPS
        ii. *Other hardware* – electronics for charging and power sensing, battery case, status of health display
        iii. *Firmware* – programmable logic to control monitoring and performance of UPS
11. *Traffic control* – all devices that assess and control the flow of objects to the RPM, to support safety of equipment and the timely movement of items for scanning
    a. *Reader board* – visual display of messages or icons to vehicle operators to instruct on actions for entry to or exit from RPM scanning
    b. *Traffic lights* – provides standard light indicators to vehicle operators to instruct on actions for entry to or exit from RPM scanning
    c. *Gate arm* – physical barrier to traffic movement

d. *Programmable logic controller (PLC)* – electronics to control any of the traffic control devices
e. *Occupancy sensor* – sensor systems, such as ground loop sensors, specifically used to signal other traffic control devices
f. *Ticket machine* – dispenses traffic management individual tickets for vehicle operators
    i. *Ticket supply* – problems associated with the ticket stock/roll (for ordering additional ticket stock, see Administrative >> Parts >> Resupply)
    ii. *Hardware* – equipment associated with the printing/conveyance of tickets
g. *Speed humps* – traffic calming device to limit the comfortable vehicle speed
h. *Bollards* – short vertical post to obstruct traffic and protect RPM and enclosures from damage
i. *Signage* – visual graphics to display fixed information inside or outside buildings or structures
j. *Other* – equipment connected to traffic control but not listed above

12. *Environmental Control* – structures and equipment to improve the environment for operators and equipment
    a. *Air conditioner* – dehumidify and extracts heat from an area using a refrigeration cycle
    b. *Humidity controller* – measures and limits humidity in the air
    c. *Enclosure heater* – supplies additional heat to limit humidity and extremely low temperatures to provide an ambient environment within electronic equipment tolerances
    d. *Utility panel (enclosure)* – cabinets and boxes which provide a protective/isolated containment for various electronic hardware and wiring interconnections
13. *Miscellaneous Infrastructure*
    a. *Area lighting* – fixtures to improve visibility and safety of sites with SLD equipment
    b. *Surveillance camera* – video equipment to improve traffic management and safety of operators and traffic in the general area surrounding the RPM
        i. *Camera* – optical device that captures a digital representation of object or scene
        ii. *Housing* – enclosure to protect camera from environmental damage or tamper
        iii. *Mounting* – equipment to attach the camera or housing to a stationary pole, wall, or ceiling
        iv. *Power supply* – electronics providing input voltage to the camera
        v. *Fuses* – electrical isolation for power control and abnormal power conditions
        vi. *Heater* – environment conditioner for all-weather operation
        vii. *Illuminator* – an energy source designed to provide illumination to objects within view of a camera; may be either in the visible or infrared spectrum
        viii. *DVR* – (Digital Video Recorder) electronic device to store video images from surveillance systems
        ix. *PTZ control* – (Pan-Tilt-Zoom) operator interface to video camera system with the ability to adjust camera direction/zoom
        x. *Other* – equipment connected to the camera but not listed above
    c. *Other* – equipment associated with Infrastructure but not listed above
14. *Administrative* (***Help Desk Use Only***)
    a. *Contracting* – providing contracting support to achieve programmatic objectives
    b. *Shipping* – providing logistical support to ship equipment
    c. *Accounts payable* – assisting LMPs with PCG/contracting support for site services
    d. *Manuals* – locating, obtaining, and providing manuals to SMs/LMPs
    e. *Media requests* – locating, obtaining, and providing software media to SMs/LMPs
    f. *Training* – supporting training program efforts (securing vendor support during training efforts)
    g. *ConOps/Procedures* – providing assistance to SMs related to equipment related policies/procedures

h. *Documentation issue* – providing technical assistance in the review/revision of documentation
i. *Design issue* – providing technical assistance to the broader program related to potential design-related issues
j. *Parts* – category for parts requests, including spares and consumables (desiccant)
    i. *Initial Order* – equipping a new site with parts prior to acceptance
    ii. *Resupply* – assisting SMs/LMPs in restocking spares and consumables (desiccant)
    iii. *Emergency* – one-off or non-spare parts requests that prevent a systems from operating (i.e. RPM panel door)
k. *Portal administration* – used to identify Service Requests associated with administering LMP's access to the SLD Portal
l. *Other* – Other administrative support for the program

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