Memorandum

U.S. Department
Of Transportation

Federal Highway Administration

6300 Georgetown Pike
McLean, Virginia 22101

Subject: **ACTION**: LTPP Directive I-156
Data Modifications using SQL Scripts by
LTPP Regional Support Contractors

Date: December 19, 2011

From: Jane Jiang
Long Term Pavement Performance Team

Reply to
Attn of: HRDI-30

To: Dr. Frank Meyer, PM - LTPP North Atlantic Regional Contract
Dr. Frank Meyer, PM - LTPP North Central Regional Contract
Mr. Tim Martin, PM - LTPP Southern Regional Contract
Mr. Kevin Senn, PM - LTPP Western Regional Contract

Attached is the Long-Term Pavement Performance (LTPP) Program Directive I-156: Data Modifications using SQL Scripts by LTPP Regional Support Contractors. Please ensure that all personnel are aware of this new directive.

Should you have any questions or would like to discuss this directive, please do not hesitate to contact me at 202-493-3149.

Attachments (4)

FHWA:HRDI-30:JJiang:mdeeney:493-3149:12/19/11
File: c:/mdeeney/directive/ims/I-156dir.doc
cc:
Jonathan Groeger
Directive Binder
LTPP Team
Official file
Chron

LONG TERM PAVEMENT PERFORMANCE PROGRAM DIRECTIVE

For the Technical Direction of the LTPP Program

Program Area:	IMS	Directive Number:	I-156
Date:	December 16, 2011	Supersedes:	NA
Subject:	*Data Modifications using SQL Scripts by LTPP Regional Support Contractors*		

The preferred practice to make changes to the central LTPP databases by Regional Support Contractors (RSC) is through use of LTPP Data Entry Portal (LDEP) forms, loaders, QC programs and LTPP Traffic Analysis Software (LTAS) software. When it is required or more effective to make modifications to the contents of the central LTPP databases with the use of Procedural Language/Standard Query Language (PL/SQL) or Standard Query Language (SQL) scripts, the formats and procedures contained in this directive shall be followed.

RSC LDEP SQL Administrator

Each RSC shall nominate one Regional LDEP SQL Administrator (RLSA). When approved by FHWA, the RLSA will be given sole authority under the regional LTPP contract to submit and execute SQL scripts on the LDEP production databases which includes the Pavement Performance Data Base (PPDB) and LTAS tables.

The RLSA is responsible for all SQL data changes made to data collected by the RSCs or for which they are responsible for data entry and review.

FHWA can require replacement of the RLSA, or other members of the RSC contract staff, if it can be demonstrated through database logs or other means that unapproved changes to the LTPP databases using the RLSA account was performed.

Changes to the RLSA shall be approved by FHWA.

SQL Data Changes

Data are defined as values of data elements which represent measured/reported values or relational database fields which are used for table joins.

The procedures in this portion of the directive do not apply to changes to RECORD_STATUS (RS) fields.

LTPP SQL Format Standards

RSC developed scripts to change data should include the following format content. Changes to this format can be made by contacting TSSC to discuss proposed changes.

1. Meta data
   - Name of RSC script author
   - Date of script creation
   - Tables being modified
   - Summary of intended changes
   - Name of secondary script reviewer
   - Other information needed to understand script(s) by TSSC reviewer

2. Script statements
   - A statement should be included to show the original condition of a record being changed.
   - Statements to modify records should include fully qualified key fields and explicit statements when needed.
   - A select statement should be included in the script to verify changes made by the script.
   - Commented out rollback statements can be included in case the approved script doesn't work correctly.

3. Commit commands
   - Commit commands should **not** be included in the SQL script making the desired data changes.
   - Commit commands should **not** be executed until the results of the intended changes executed by SQL commands have been verified and confirmed.
   - A commit command should be executed when the RSC has verified that all changes made during each session have made only the desired changes.

Attachment 1 presents the general SQL script format. Attachment 2 contains an example SQL statement. Attachment 3 contains the results of running the script shown in Attachment 2.

LDEP SQL Development, Approval, and Application Process

The following process shall be used for development and application of SQL scripts by RSC which change data.

1. Create a formal SQL script in accordance with LTPP SQL standards.

2. Have the script reviewed by a secondary RSC source.

3. When possible test the script on the LDEP **test** instance.

4. RLSA submit the script for approval using the LDEP - Issues/SPR – Data Update Via Scripts project. The following guidelines should be followed when adding a new issue:

- Tracker - Select data issue
- Subject - Name of table or module affected
- Description - Update, addition or deletion as applicable is sufficient for changes to a single table. Table names and actions should be listed if a module is the subject.
- Status - New
- Priority should be Normal unless the modification is time critical. High priority changes should also be communicated to the TSSC via phone or e-mail. Contact numbers are posted on the LDEP.
- Assigned to - a member of the TSSC who regularly works with the production instance (other than the DBA is preferred)
- Target version - Leave blank
- Submitting organization - Region submitting
- Regional ID - optional
- Due date - optional
- Estimated time - optional
- QC manual updated - blank
- Date complete - blank
- Files - add as many as apply. The preferred file name convention is NNN_RR_DATA_Action.sql. NNN is an ID number assigned by the RSC (preferably the issue number in the Redmine system, once it has been assigned). RR is the region. DATA is data type being modified. Action is the type of action being performed, typically an update or delete.

5. The nominal time period for TSSC review of RSC scripts is within three working business days from submission. While TSSC will try and respond to all script approval requests on an as soon as possible basis, RSC should notify the TSSC when script approval is urgent. TSSC contact names are posted on the LDEP. TSSC approval of a script only

implies that the script has been examined primarily for unintended data change consequences, and secondarily for syntax errors. RSC are assigned responsibility for the data changes being made with the supplied scripts.

6. If the script is approved, the TSSC will change the status to "Ready to Apply". If the script has issues the status will be updated to "Script has Errors" and comments or questions will be provided in the update to the issue record.

7. After approval the RLSA applies the approved script. These instructions and scripts assume the use of APEX and the SQL Scripts functionality of SQL workshop. To upload a script, select the file to be run. When the script is loaded it may be reviewed via the edit function. Run the script by selecting the run icon in line with the script name. Use the Run Now option. Once the script runs, click on the icon under review results. Bring up the Detailed, rather than the Summary results to see the actual output rather than the execution status. If the results are as expected, edit the script to replace the rollback with a commit or comment the rollback out. To get a copy of the results, open them in a new tab or window (once to get the list of results and a second time to get the actual results to print). Create a pdf with the name NNN_results_committed.pdf where NNN is an ID number assigned by the RSC (or issue number in the Redmine system).

8. RSLA changes the issue record status to Complete and enters the completion date.

SQL RECORD_STATUS Changes

A RSLA may change RECORD_STATUS without prior review of the script by TSSC. The scripts used for these changes should be stored in the LDEP - Issues/SPR – Data Update Via Scripts project. The suggested file naming convention is NNN_RR_DATA_RSchg.sql, where NNN is the RSC assigned ID number (or redmine issue number), RR is the region, DATA is the data type being altered, and RSchg represents a RECORD_STAUS change action. The RSLA should change the status to Complete and enter a completion date in the Redmine issue system.

Prepared by: TSSC and FHWA

Approved by:

Aramis López, Jr.
LTPP Team Leader

Attachment 1. General Script Template

```
-- Created by:
-- Date:
-- Table:
--
-- Reviewed by:
--
-- Executed by:
--
--------------------------------------------------------------------------
-- Original condition
--------------------------------------------------------------------------


--------------------------------------------------------------------------
-- Change
--------------------------------------------------------------------------


-- commit;
--------------------------------------------------------------------------
-- Verify change
--------------------------------------------------------------------------


rollback;
```

Attachment 2. Example SQL Data Change Script

File Name: 458_NCRO_MON_DEFL_LOC_INFO_Update.sql

```
-- Created by:          cleal
-- Date:                11/10/2011
-- Table:               MON_DEFL_LOC_INFO
--
-- Reviewed by:         bkostrom
--
-- Executed by:         bkostrom
--
/*
This is a script to upgrade the Pavement Surface Temperature of two records in MON_DEFL_LOC_INFO
that have incorrect values for section 184042 on test date 12-OCT-2011.
2
3 SCRIPT:
4
5 update MON_DEFL_LOC_INFO set PVMT_SURF_TEMP='21.2' where state_code=18 and
shrp_id='4042' and test_date='12-OCT-2011' and test_time='0954';
6 update MON_DEFL_LOC_INFO set PVMT_SURF_TEMP='21.8' where state_code=18 and
shrp_id='4042' and test_date='12-OCT-2011' and test_time='0957';
*/
--------------------------------------------------------------------------
-- Original condition
--------------------------------------------------------------------------
select * from mon_defl_loc_info
where state_code=18
and shrp_id='4042'
and test_date='10/12/2011'
and test_time='0954';

--------------------------------------------------------------------------
-- Change
--------------------------------------------------------------------------
update MON_DEFL_LOC_INFO
 set PVMT_SURF_TEMP='21.2'
 where state_code=18
 and shrp_id='4042'
 and test_date='10/12/2011'
 and test_time='0954';

-- commit;
--------------------------------------------------------------------------
-- Verify change
--------------------------------------------------------------------------
select * from mon_defl_loc_info
where state_code=18
and shrp_id='4042'
and test_date='10/12/2011'
and test_time='0954';
--------------------------------------------------------------------------
```

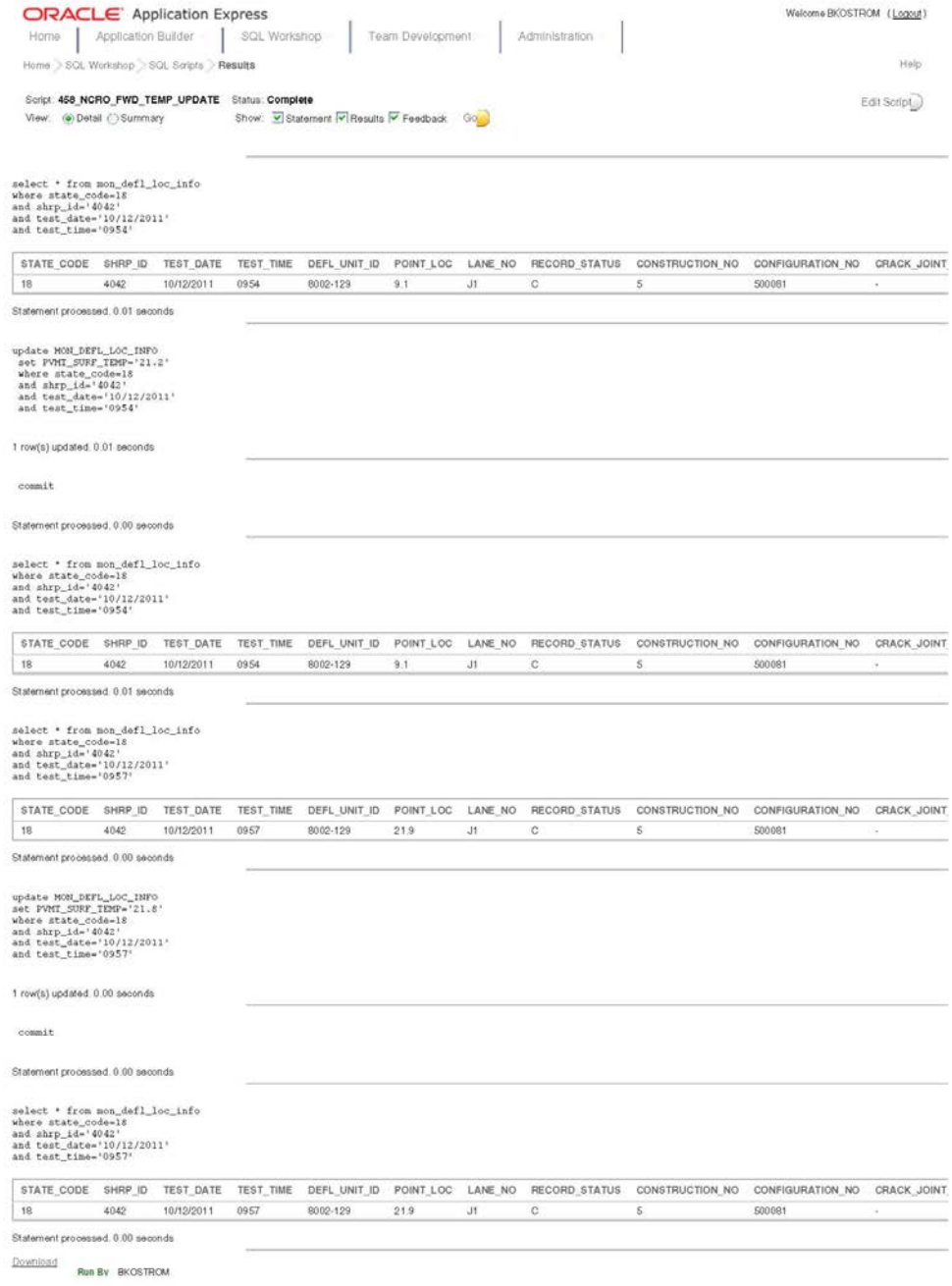
```
-- Original condition
--------------------------------------------------------------------------
select * from mon_defl_loc_info
where state_code=18
and shrp_id='4042'
and test_date='10/12/2011'
and test_time='0957';

--------------------------------------------------------------------------
-- Change
--------------------------------------------------------------------------
update MON_DEFL_LOC_INFO
set PVMT_SURF_TEMP='21.8'
where state_code=18
and shrp_id='4042'
and test_date='10/12/2011'
and test_time='0957';

-- commit;
--------------------------------------------------------------------------
-- Verify change
--------------------------------------------------------------------------
select * from mon_defl_loc_info
where state_code=18
and shrp_id='4042'
and test_date='10/12/2011'
and test_time='0957';

rollback;
```

Attachment 3. Output from Script Application



ORACLE Application Express

Welcome BKOSTROM (Logout)

Home | Application Builder | SQL Workshop | Team Development | Administration

Home > SQL Workshop > SQL Scripts > Results

Help

Script: 458_NCRO_FWD_TEMP_UPDATE Status: Complete

Edit Script

View: Detail Summary Show: Statement Results Feedback Go

```
select * from mon_defl_loc_info
where state_code=18
and shrp_id='4042'
and test_date='10/12/2011'
and test_time='0954'
```

STATE_CODE	SHRP_ID	TEST_DATE	TEST_TIME	DEFL_UNIT_ID	POINT_LOC	LANE_NO	RECORD_STATUS	CONSTRUCTION_NO	CONFIGURATION_NO	CRACK_JOINT
18	4042	10/12/2011	0954	8002-129	9.1	J1	C	5	500081	-

Statement processed. 0.01 seconds

```
update MON_DEFL_LOC_INFO
 set PVMT_SURF_TEMP='21.2'
 where state_code=18
 and shrp_id='4042'
 and test_date='10/12/2011'
 and test_time='0954'
```

1 row(s) updated. 0.01 seconds

```
commit
```

Statement processed. 0.00 seconds

```
select * from mon_defl_loc_info
where state_code=18
and shrp_id='4042'
and test_date='10/12/2011'
and test_time='0954'
```

STATE_CODE	SHRP_ID	TEST_DATE	TEST_TIME	DEFL_UNIT_ID	POINT_LOC	LANE_NO	RECORD_STATUS	CONSTRUCTION_NO	CONFIGURATION_NO	CRACK_JOINT
18	4042	10/12/2011	0954	8002-129	9.1	J1	C	5	500081	-

Statement processed. 0.01 seconds

```
select * from mon_defl_loc_info
where state_code=18
and shrp_id='4042'
and test_date='10/12/2011'
and test_time='0957'
```

STATE_CODE	SHRP_ID	TEST_DATE	TEST_TIME	DEFL_UNIT_ID	POINT_LOC	LANE_NO	RECORD_STATUS	CONSTRUCTION_NO	CONFIGURATION_NO	CRACK_JOINT
18	4042	10/12/2011	0957	8002-129	21.9	J1	C	5	500081	-

Statement processed. 0.00 seconds

```
update MON_DEFL_LOC_INFO
set PVMT_SURF_TEMP='21.8'
where state_code=18
and shrp_id='4042'
and test_date='10/12/2011'
and test_time='0957'
```

1 row(s) updated. 0.00 seconds

```
commit
```

Statement processed. 0.00 seconds

```
select * from mon_defl_loc_info
where state_code=18
and shrp_id='4042'
and test_date='10/12/2011'
and test_time='0957'
```

STATE_CODE	SHRP_ID	TEST_DATE	TEST_TIME	DEFL_UNIT_ID	POINT_LOC	LANE_NO	RECORD_STATUS	CONSTRUCTION_NO	CONFIGURATION_NO	CRACK_JOINT
18	4042	10/12/2011	0957	8002-129	21.9	J1	C	5	500081	-

Statement processed. 0.00 seconds

Download

Run By BKOSTROM

Results

Statements Processed 8
Successful 8
With Errors 0