Objective
To evaluate the department’s procedures and handling of hazardous materials in conformance with established policies and regulations.

Opinion
Based on the audit scope areas reviewed, control mechanisms are effective and sustainable and substantially address risk factors and exposures considered significant relative to impacting operational execution and regulatory compliance. The organization's system of internal controls provides reasonable assurance that key goals and objectives will be achieved despite improvement opportunities identified. Improvement opportunities identified include minor enhancements that would improve achievement of objectives but are not currently resulting in negative impacts to the organization.

Overall Engagement Assessment: Satisfactory

<table>
<thead>
<tr>
<th>Findings</th>
<th>Control Design</th>
<th>Operating Effectiveness</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Finding 1</td>
<td>District Nuclear Safety Officer Compliance with Program Procedures.</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Finding 2</td>
<td>Nuclear Density Gauge User Compliance with Program Procedures.</td>
<td>x</td>
<td>x</td>
</tr>
</tbody>
</table>

Management concurs with the above findings and prepared management action plans to address deficiencies.

Internal Environment
The Radiation Safety Officer (RSO) has developed and provided detailed procedures for implementing the Radiation Protection Program, which includes annual inspections and audits, extensive inventory controls, and detailed steps to help ensure program goals are met. The RSO and District Nuclear Safety Officers (DNSOs) respond immediately to inspections conducted by the Department of State Health Services (DSHS) and quickly correct deficiencies. Prior audit findings have noted some areas for improvement which have been addressed and best practices were noted for improved efficiency and cost savings to the department.
Summary Results

<table>
<thead>
<tr>
<th>Scope Area</th>
<th>Finding</th>
<th>Evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Program Control and Monitoring</td>
<td>1</td>
<td>• 8 of 52 (15%) missing documentation of Inventories - SL4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 7 of 52 (13%) missing documentation of required Audits - SL4</td>
</tr>
<tr>
<td>Storage, Security, and Safety</td>
<td>1 &amp; 2</td>
<td>• 9 of 52 (17%) Emergency Procedures not current - SL3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 15 of 119 (13%) of Notices to Employees were missing or outdated - SL5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 4 of 119 (3%) of Gauge Labels worn or illegible - SL3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 4 of 119 (3%) of Gauge Handles unsecured - SL3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 3 of 119 (3%) of Gauge Cases unsecured- SL3</td>
</tr>
<tr>
<td>Maintenance and Calibration</td>
<td>1</td>
<td>• 15 of 52 (29%) Survey Meter Calibrations not done - SL4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 8 of 52 (15%) missing documentation of Leak Tests, Visual Inspections,</td>
</tr>
<tr>
<td></td>
<td></td>
<td>and Inventories - SL4</td>
</tr>
<tr>
<td>Transporting Gauges</td>
<td>2</td>
<td>• 16 of 119 (13%) of Gauge Case Stickers illegible - SL3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 4 of 119 (3%) of Transport Papers outdated/missing - SL3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 4 of 119 (3%) of Check-In/Check-Out logs incorrectly completed - SL4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 3 of 119 (3%) of Gauge Cases with holes - SL4</td>
</tr>
</tbody>
</table>

Severity Level Ratings: The SL1 – SL5 are the severity ratings of issues as they would be rated in the Department of State Health Services inspection reports. Range: SL1 = Most Severe, SL5 = Least Severe.

Audit Scope
The audit was performed by Jill Collett, Letta Hinton, Milan Hawkins, and Timothy Owen (Engagement Lead). The audit was conducted during the period from January 14, 2013 to February 21, 2013.

Methodology
The audit work performed included:
• Review of prior violations issued by the Department of State Health Services.
• Interviews with key personnel, including the Construction Division Director, Materials and Pavements (CSTM&P) Section Director, the Radiation Safety Officer (RSO) and the District Nuclear Safety Officers (DNSOs).
• Storage sites and records were inspected for annual inventories, annual audits, leak tests, visual inspections, posting of emergency procedures, posting of Notice to Employees and calibration of survey meters.
• The Nuclear Density Gauges (NDGs) were inspected for locks, base and handle labels, loose shielding, and the NDG Check-In/Check-Out log. The case for each NDG was inspected for transport papers, Emergency Procedures, required labels on front and back of case, and locks. Notice to Employees was also inspected in the NDG storage areas.
Background
This report was prepared for the Transportation Commission, TxDOT Administration and Management. The report presents the results of the Radiation Protection Program Audit which was conducted as part of the Fiscal Year 2013 Audit Plan.

Materials and Pavements Section (CSTM&P) of the Construction Division (CST) is responsible for maintaining and managing the department’s nuclear license that is issued by the Department of State Health Services (DSHS) Radiation Control Division (DSHS-RC). The Radiation Safety Officer (RSO) in CSTM&P oversees the program with the assistance of District Nuclear Safety Officers (DNSOs). Each district has one DNSO who oversees the program in their respective districts. The RSO employs Total Quality Management principles in the management of the Radiation Protection Program.

Nuclear Density Gauges (NDGs), which are used by inspectors to test moisture density in compacted road base prior to laying pavement, contain radioactive elements; therefore State law requires detailed accounting of the use, maintenance, calibration, location, and transfer of the NDGs. Every year the inspectors from DSHS-RC make dozens of surprise inspections of the department’s NDG storage locations. Improper use, storage, and transfers of NDGs may result in an administrative violation and possible penalties issued to the department and the individual department employee.

We conducted this performance audit in accordance with Generally Accepted Government Auditing Standards and in conformance with the International Standards for the Professional Practice of Internal Auditing. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

A defined set of control objectives was utilized to focus on operational and regulatory goals for the identified scope areas. Our audit opinion is an assessment of the health of the overall control environment based on (1) the effectiveness of enterprise risk management activities throughout the audit period and (2) the degree to which the defined control objectives were being met. Our audit opinion is not a guarantee against operational sub-optimization or regulatory non-compliance, particularly in areas not included in the scope of this audit.
Best Practices:

Identifying Gauge Users that Leave the Department - Beaumont District DNSO
The DNSO was concerned with the security of the NDGs when users left the agency. As a result, the DNSO implemented a process for changing the locks and/or combinations on nuclear storage facilities, when certified NDG users leave the agency.

Laminated Transport Documents – Waco District DNSO
The DNSO laminated the Bill of Lading and the Emergency Procedures back-to-back. This makes the paperwork more durable and more easily accessible to the user during gauge transport. Additional benefits include cost savings through reduced wear and tear of the documents and improved legibility.

Gauge Packet Example – San Antonio District DNSO
The DNSO created a “Gauge Packet Example” explaining in detail, with pictures, how to use the gauge and how to calculate results. A complete packet is with the gauge at all times. The DNSO provided a copy to NDG users and to managers as reference material.

Electronic Inventory of District Gauges – San Antonio District DNSO
The DNSO created an electronic Inventory List to 1) help track the location and movement of gauges and 2) to track inventory/audit dates at all the locations in the district, as well as, survey meter calibration dates. The DNSO is currently working to make a database program to help him track this information.

Reduced Risk by Reduction of Gauges – Radiation Safety Officer
The RSO has continued to work with districts to reduce the number of NDGs since 2004 (39%). The reduction has resulted in cost savings to the department through reduced calibration and repair costs of approximately $80,000 per year. There is also a savings to the department with improved efficiency with fewer gauges to manage and a subsequent reduction in risk of receiving a violation from DSHS.
Detailed Findings and Management Action Plans (MAP)

Finding No. 1: District Nuclear Safety Officer Compliance with Program Procedures

There were 12 of 14 (86%) District Nuclear Safety Officers (DNSOs) in selected districts who were not fully complying with program procedures. Deficiencies were noted in adherence to procedures when conducting and documenting annual inventories, audits, leak tests, visual inspections, and in calibration of survey meters.

The following exceptions were noted with DNSOs and their compliance with program procedures:

- 29% (15 of 52) Survey Meter Calibrations were not completed - SL4*
- 17% (9 of 52) Emergency Procedures were not current - SL3*
- 15% (8 of 52) missing documentation of Inventories - SL4*
- 15% (8 of 52) missing documentation of Leak Tests and Visual Inspections - SL4*
- 13% (7 of 52) missing documentation of required Audits - SL4*

*Severity Level Ratings: The SL1 – SL5, SL1 = Most Severe, SL5 = Least Severe

TxDOT Radiation Protection Program & Standard Operating Procedures (SOP) for Radioactive Material sets forth the policies and procedures for program operation based on statutory requirements of TAC 25 Part 1, Chapter 289 Subchapter D and E.

Noncompliance is caused in part by DNSO responsibilities not being a full time or primary duty of that employee. As a result, some DNSOs may not always be familiar with all the requirements of the SOPs as they are written.

Effect/Potential Impact:
Failure to comply with procedures may result in administrative violations issued by the Department of State Health Services (DSHS) and potential loss of license.

Management Action Plan (MAP):

MAP Owners: David Belser, TxDOT Radiation Safety Officer (RSO), Construction Division (CST); Aida Guzman, CST Division Nuclear Safety Officer and RSO Designee; and District Nuclear Safety Officers (DNSOs)

MAP 1.1 - RSO will conduct statewide webinars with District Nuclear Safety Officers and Laboratory Supervisors to review audit findings and discuss proposed MAPs.

Completion Date: May 15, 2013
MAP 1.2 - The utilization of CST’s electronic Radiation Safety Program records management system, optional to date, will be made mandatory statewide for all Districts and DNSOs. Measure will facilitate RSO desktop monitoring of records and actions.

Completion Date: Policy will be updated in the revisions to the Radiation Protection Program and Standard Operating Procedures for Radioactive Materials manual by June 15, 2013. Implementation progress will be monitored quarterly. Target completion of implementation by December 15, 2013.

MAP 1.3 - RSO office will continue implementation of a programmatic district site visit plan for training and program inspection. Six (6) to eight (8) site visits will be planned each year. Scheduling of district site visits will be on a 3 year rotating basis. Other off-schedule visits will be conducted as necessary

Completion Date: Formalized 3-year schedule will be developed by June 15, 2013. District site visits will be ongoing.

MAP 1.4 - Utilization of Calibration Manager to track survey meter calibrations will be made mandatory.

Completion Date: June 15, 2013
Finding No. 2: Nuclear Density Gauge User Compliance with Program Procedures

There were 7 of 14 (50%) districts reviewed that were not fully complying with program procedures. Deficiencies were noted in adherence to procedures for the handling/labeling of some nuclear density gauges (NDGs) and cases.

The following deficiencies were noted with NDG users and their compliance with program procedures:

- 13% (16 of 119) of Gauge Case Stickers were illegible - SL3*
- 13% (15 of 119) of Notices to Employees were missing or outdated - SL5*
- 3% (4 of 119) of Gauge Labels were worn or illegible - SL3*
- 3% (4 of 119) of Gauge Handles were unsecured - SL3*
- 3% (3 of 119) of Gauge Cases were unsecured - SL3*
- 3% (4 of 119) of Transport Papers were outdated/missing - SL3*
- 3% (4 of 119) of Check-In/Check-Out logs were incorrectly completed - SL4*
- 3% (3 of 119) of Gauge Cases contained holes in them - SL4*

*Severity Level Ratings: The SL1 – SL5, SL1 = Most Severe, SL5 = Least Severe

TxDOT Radiation Protection Program & Standard Operating Procedures for Radioactive Material sets forth the policies and procedures for program operation based on statutory requirements of TAC 25 Part 1, Chapter 289 Subchapter D and E.

Noncompliance may be caused by a limited understanding of the standard operating procedures by end users, who do not fully understand the impact of the noncompliance to both the agency and the employee.

Effect/Potential Impact:
Failure to comply with procedures may result in administrative violations issued by the Department of State Health Services (DSHS) and potential loss of license.

Management Action Plan (MAP):

MAP Owner: David Belser, TxDOT Radiation Safety Officer (RSO), Construction Division (CST); Aida Guzman, CST Division Nuclear Safety Officer and RSO Designee; and District Nuclear Safety Officers (DNSOs)

MAP 2.1 - As noted for Finding 1, RSO will conduct statewide webinars with District Nuclear Safety Officers (DNSOs) and Laboratory Supervisors to review audit findings and discuss proposed MAPs.

Completion Date: May 15, 2013

MAP 2.2 - DNSOs will be required to physically verify that Emergency Procedures and Notice to Employees are current and posted as required at all storage sites and that Emergency Procedures are included with each set of transport papers. Current copies
of each are posted on CST’s Radiation Safety intranet site. DNSOs must report back to RSO with confirmation by the requested deadline.

**Completion Date:** June 15, 2013

**MAP 2.3** - Check-In/Check-Out logs will be reported electronically to DNSOs quarterly. DNSOs will monitor logs for completeness.

**Completion Date:** July 15, 2013

**MAP 2.4** - All other deficiencies in Finding 2 are visual inspection related items. The frequency of visual inspections, currently annual, will increase to every six (6) months to ensure closer monitoring of gauge, case, and label conditions. DNSOs will report visual inspection forms to electronic records system, which RSO office will monitor accordingly. Required frequency may revert back to the national standard of annually at such time effective monitoring is restored.

**Completion Date:** Policy will be updated in the revisions to the Radiation Protection Program and Standard Operating Procedures for Radioactive Materials manual by June 15, 2013.

The Radiation Protection Program and Standard Operating Procedures for Radioactive Materials will be revised to reflect the above changes, as applicable by June 15, 2013.
Observations and Recommendations

Audit Observation No. 1: Radiation Safety Officer Oversight in the Districts

The Radiation Safety Office (RSO) has limited or no oversight in the Districts over the District Nuclear Safety Officer (DNSO), gauge users, or anyone at the storage facilities. DNSO duties are not always included in DNSO performance plans and the RSO generally does not provide feedback to the supervisors of the DNSOs in regards to their performance of their duties and responsibilities in the program.

Effect/Potential Impact: If DNSOs duties are not included in their performance plans they may not be given credit for work performed in the radiation protection program.

Audit Recommendation: The supervisor of each DNSO should ensure that Nuclear Safety duties are included in the employee’s evaluation. The supervisor of the DNSO should communicate with the RSO as needed during the evaluation process to properly evaluate the DNSOs performance.

Audit Observation No. 2: Security of Dosimetry Records

Dosimetry records were located in unlocked filing cabinets. No procedures were in place to secure the social security numbers and personal information printed on the dosimetry files. The Radiation SOPs state on page 2 that “DNSOs are responsible for maintaining secured archived dosimetry records.”

Effect/Potential Impact: Employees are unaware that these records should be kept locked at all times; as a result, unauthorized personnel may gain access to the records and obtain highly confidential information for improper use.

Audit Recommendation: Dosimetry files should be located in a secured central location such as the RSOs office in Austin to limit access to personal information as much as possible.

Audit Observation No. 3: Records Retention Schedule

In both the District Labs and Area Offices, it was observed that some records were being kept past their record retention schedule. DNSOs advised that records retention is not an area reviewed by the Department of State Health Services and therefore is not considered to be a high priority. Retaining records of any kind past the Records Retention Schedule is against TxDOT policy.
Effect/Potential Impact: TXDOT is exposed to the risk of possible litigation when records are retained beyond the required retention period.

Audit Recommendation:
The RSO should stress the importance of following the retention schedule as printed on the File Index in the back of the SOPs. DNSOs should practice records retention and also include review of compliance with the retention schedule when conducting annual audits and purging records as they surpass their retention date.
Summary Results Based on Enterprise Risk Management Framework

<table>
<thead>
<tr>
<th>Audit Results Dashboard</th>
<th>Radiation Protection Program Audit</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Scope Areas Evaluated</strong></td>
<td><strong>ERM Component</strong></td>
</tr>
<tr>
<td><strong>Business Objectives (Financial, Operational, Regulatory)</strong></td>
<td><strong>O, R</strong></td>
</tr>
<tr>
<td>Internal Environment</td>
<td>Organizational Tone</td>
</tr>
<tr>
<td></td>
<td>Ethical Culture &amp; Attitude</td>
</tr>
<tr>
<td>Objective Setting</td>
<td>Planning</td>
</tr>
<tr>
<td></td>
<td>Forecasting</td>
</tr>
<tr>
<td></td>
<td>Goal-Setting</td>
</tr>
<tr>
<td>Event Identification</td>
<td>Business Continuity</td>
</tr>
<tr>
<td>Risk Assessment</td>
<td>Supporting Evidence/Records Availability</td>
</tr>
<tr>
<td>Risk Response</td>
<td>Segregation of Duties</td>
</tr>
<tr>
<td></td>
<td>Safeguarding Assets</td>
</tr>
<tr>
<td>Control Activities</td>
<td>Policies/Procedure Development &amp; Maintenance</td>
</tr>
<tr>
<td></td>
<td>Approvals/Authorizations</td>
</tr>
<tr>
<td></td>
<td>Information Classification</td>
</tr>
<tr>
<td>Information &amp; Communication</td>
<td></td>
</tr>
<tr>
<td>Monitoring</td>
<td></td>
</tr>
<tr>
<td>Scope Area Assessment</td>
<td></td>
</tr>
</tbody>
</table>

**Closing Comments**

The results of this audit were discussed with the CST Director, CST M&P Section Director and the Radiation Safety Officer in an exit conference held on March 26, 2013. The results were also provided to the Office of General Counsel and the Deputy Executive Director/Chief Engineer via e-mail.

We would like to thank the District Nuclear Safety Officers, Area Office employees and Maintenance Office employees contacted during this audit for their assistance and cooperation.