

State of Colorado

Year 2000 Progress Summary

Fiscal Year 1999/2000

For the Month Ending November 30 1999



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1. Statewide Project Information

1.1 Background

This is the November 1999 monthly report on the status of the Year 2000 effort within the State of Colorado. This report is published by the Governor's Office of Information and Technology (OIT) Year 2000 Project Office (Project Office). The purpose of this information is to provide stakeholders with an update on the State's progress to achieve Year 2000 compliance for information systems. The Project Office employed a four-step project delivery process for the oversight and direction of Year 2000 readiness. The phases of the project delivery process are planning, delivery, internal verification and independent verification and validation (IV&V). This report documents the current status of Year 2000 readiness.

1.2 Risk Management

Throughout the four-step project delivery process, the Project Office has had the task to minimize Year 2000 risk. The risk management activity by the Project Office has two areas of focus: risk assessment and active risk management.

1.2.1 Risk Assessment

A number of factors are considered in risk assessment such as project progress, feedback from department project personnel and the evaluation of code and project processes by independent experts. The current Project Office assessment is that the State has a low risk of Year 2000 failure. The Project Office has clear and objective evidence on which to base the assessment.

1.2.2 Active Risk Management

In the past, the active risk management focus was to ensure that application system projects concluded on time. Presently, the focus of active risk management is to ensure that the current low level of risk is sustained between now and the beginning of the Year 2000.

Based on the current statewide risk assessment and the short time remaining before the end of 1999, the active risk management focus of the Project Office has two goals.

- First, to ensure that statewide department actions taken between now and the end of 1999 do not introduce added risk to Information Technology systems,
- Second, to focus the departments' attention to take action on those IV&V recommendations that will reduce Year 2000 risk. Please refer to Section 1.3.2.2 for more details.

In pursuit of these two goals the Project Office has taken two actions.

- The Project Office encouraged department cooperation to institute a source code freeze in departments where an IV&V recommendation to remove obsolete source code or improve configuration management was received.

- The Project Office has actively tracked and supported the implementation of risk reducing IV&V recommendations between now and the end of 1999. Based on the IV&V data, the Project Office has chose to ensure departments implement IV&V testing recommendations, particularly in high impact departments.

1.2.3 Tracking of Fatal and Critical Projects

All fatal and critical Year 2000 projects were completed as of the end of October 1999.

1.2.4 Project Slippage

The Project Office monitors all projects when a slippage in projected completion date occurs, regardless of impact level. *Figure 1.2.4-1: Completion Date Slippage* lists the projects that have moved their end dates beyond what was reported as of August 1998. The Project Office believes that project managers had sufficient time prior to August 1998 to re-plan their projects and that any end date slippage occurring since August 1998 is cause for concern. Slippage for new projects added after August 1998 will be computed based upon slippage from the project's original planned end month.

These projects are monitored closely by the Project Office staff. The Project Office contacts department management regarding projects that have completion date slippage. The column titled 'Slippage From Aug-1998 Reported End Date' indicates the number of months a project has slipped since the August 1998 reporting period. The next column, 'Slippage From Previous Month's Reported End Date', shows the number of months slippage that occurred in November 1999. A project will be removed from this chart once it completes or if the slippage from August 1998 is reduced to zero.

Department	Project ID	Impact Level	Slippage From Aug-1998 Reported End Date	Slippage From Previous Month's Reported End Date	Current Estimated Month To Complete
Public Safety	HW-N	Manageable	2	0	Dec 1999
Public Safety	SickAL-N	Manageable	2	0	Dec 1999
Public Safety	SW-N	Manageable	2	0	Dec 1999
Revenue **	Software Structure Compliance	Manageable	0	0	Nov 1999
Transportation	PC/Networks	Manageable	3	1	Dec 1999
* Project is a new addition to the Slippage Chart as of this reporting period.					
** Project has completed or has erased slippage since last reporting period and will be removed from chart next reporting period.					

Figure 1.2.4-1: Completion Date Slippage

The number of slipped projects is four as of the end of November 1999. The CICS Migration project at Revenue completed in October and no new projects were added to the list. During November, Transportation's PC/Networks project remained on the chart and slipped an additional month.

All four projects on the slippage chart have a manageable impact and a December completion date.

1.2.5 Project Status

Department progress scores are a composite of project scores weighted by the size of each project. As individual project scores are based on variances against plan, the Project Office believes that this is a reliable indicator of project and department progress. The monthly department progress score is based upon active and late projects only.

The following chart, *Figure 1.2.5-1: Statewide Project Rating Chart* summarizes the progress and scope of each department's Year 2000 effort. Four departments report no Year 2000 issues and do not appear in the chart: Governor's Office, Legislature, Military Affairs and Public Defender.

Department	Progress Rating	All Y2K Projects				Fatal/Critical Y2K Projects Only			
		Future	Active	Complete	Total	Future	Active	Complete	Total
Agriculture	Complete	0	0	1	1	0	0	0	0
Education	Complete	0	0	8	8	0	0	6	6
Health Care Policy and Finance	Complete	0	0	1	1	0	0	1	1
Judicial	Complete	0	0	4	4	0	0	4	4
Labor and Employment	Complete	0	0	50	50	0	0	23	23
Law	Complete	0	0	1	1	0	0	1	1
Local Affairs	Complete	0	0	1	1	0	0	0	0
Natural Resources	Complete	0	0	3	3	0	0	3	3
Regulatory Agencies	Complete	0	0	4	4	0	0	1	1
Treasury	Complete	0	0	1	1	0	0	1	1
Public Health and Environment	Complete	0	0	12	12	0	0	5	5
Revenue	Complete	0	0	14	14	0	0	9	9
Corrections	5	0	1	5	6	0	0	5	5
Human Services	5	0	2	21	23	0	0	13	13
Personnel	5	1	1	20	22	0	0	6	6
Secretary of State	5	0	1	2	3	0	0	2	2
Transportation	3	0	1	8	9	0	0	3	3
Public Safety	2.6	0	3	9	12	0	0	2	2
STATEWIDE as of Nov 1999	N/A	1	9	165	175	0	0	85	85
STATEWIDE as of Oct 1999	N/A	2	13	160	175	0	0	85	85

Figure 1.2.5-1: Statewide Project Rating Chart

As the chart indicates, all fatal and critical projects have completed. The progress rating of complete indicates that the department has finished their Year 2000 projects.

The progress ratings for the Departments of Public Safety and Transportation are below 5 due to active projects that have slipped completion dates. The Department of Public Safety plans to complete their Sick and Annual Leave system and various hardware and software upgrades in December. The Department of Transportation's PC/Network project is now three months behind schedule due to hardware vendor delays.

Figure 1.2.5-1 shows there are 165 completed (Complete) projects, leaving 10 projects yet to be completed (Future and Active). *Figure 1.2.5-2: Statewide Project Counts by Completion Month*, is presented below to show when the 10 remaining projects are projected to complete.

Completion Month	Fatal and Critical Project Count	Marginal and Manageable Project Count	Totals
Completed	85	80	165
Dec 1999	0	6	6
After Dec 1999	0	4	4
Totals	85	90	175

Figure 1.2.5-2: Statewide Project Counts by Completion Month

The previous progress report, for October 1999, indicated that four manageable/marginal projects were projected to complete in November 1999. In fact, four manageable/marginal projects did complete. The four projects scheduled to complete after December 1999 are post-implementation support projects. The six non-support projects that are scheduled to complete in December 1999 represent an estimated effort, in December, of 819 hours.

1.3 System Verification

Two levels of system verification were utilized to provide confidence that the State of Colorado's information systems would be ready for the Year 2000. The first level was an internal verification by the Project Office and the departments that sufficient documentation was available to demonstrate that diligent efforts were extended to address the Year 2000 problem. The second level included an independent verification process whereby an independent organization(s) performed standard verification processes. These two levels of system verification are described below.

1.3.1 Internal System Verification

An internal verification process was designed by the Project Office to provide reasonable confidence that a process was followed to remediate and test individual information systems for Year 2000 compliance. This internal verification was accomplished through the review of the required documentation needed to create a reasonable and auditable record of due diligence.

In accordance with the process detailed in the document: *Colorado Year 2000 System Verification Process* dated June 30, 1998, the Project Office instituted a grading system that indicated the progress on the internal verification of fatal and critical systems. Verification grades were applied to an individual information system. This was different from project progress grading, discussed in Section 1.2.5. Project progress grades applied to projects that may have encompassed one or more information systems.

The verification grading process tracked all information systems with an impact level of fatal or critical. The Year 2000 project tracked 159 fatal or critical systems out of 745 total inventoried. The following chart, *Figure 1.3.1-1: Statewide Internal Verification Rating Chart*, summarizes the progress of each department's Year 2000 verification effort associated with these fatal/critical systems.

Department	Verification Rating	Status of Fatal/Critical Systems					
		Remediating	Testing	Complete and awaiting Notification to Verify	Complete and Notified for Verification	Complete and Verified	Total Fatal/Critical Systems
Corrections	Complete	0	0	0	0	8	8
Education	Complete	0	0	0	0	19	19
Health Care Policy and Financing	Complete	0	0	0	0	1	1
Human Services	Complete	0	0	0	0	16	16
Judicial	Complete	0	0	0	0	10	10
Labor and Employment	Complete	0	0	0	0	27	27
Law	Complete	0	0	0	0	3	3
Natural Resources	Complete	0	0	0	0	3	3
Personnel	Complete	0	0	0	0	26	26
Public Health and Environment	Complete	0	0	0	0	7	7
Public Safety	Complete	0	0	0	0	2	2
Regulatory Agencies	Complete	0	0	0	0	5	5
Revenue	Complete	0	0	0	0	22	22
Secretary of State	Complete	0	0	0	0	3	3
Transportation	Complete	0	0	0	0	6	6
Treasury	Complete	0	0	0	0	1	1
Agriculture	N/A	0	0	0	0	0	0
Governor	N/A	0	0	0	0	0	0
Legislature	N/A	0	0	0	0	0	0
Local Affairs	N/A	0	0	0	0	0	0
Military Affairs	N/A	0	0	0	0	0	0
Military Affairs	N/A	0	0	0	0	0	0
Public Defender	N/A	0	0	0	0	0	0
STATEWIDE as of Nov 1999	N/A	0	0	0	0	159	159
STATEWIDE as of Oct 1999	N/A	0	0	0	0	159	159

Figure 1.3.1-1: Statewide Internal Verification Rating Chart

This chart indicates that all fatal and critical systems have completed the internal verification phase of the Year 2000 process. Six departments have a Verification Rating of N/A. These departments have no systems classified as fatal or critical.

1.3.2 Independent System Verification and Validation

Independent verification and validation, the last phase in the Project Office Year 2000 process was conducted on fatal/critical source code and on the processes and documentation associated with fatal/critical system Year 2000 development efforts. Independent verification and validation of Year 2000 activities was one of the final steps in the due diligence process. This provided the State and its citizens with a high level of confidence that the State's systems were remediated and that they should accurately process information and provide critical services in the Year 2000.

Results from the IV&V effort to evaluate fatal and critical code and to review processes used to correct fatal and critical systems began to materialize in August and all results are now available in this report. The results and corresponding responses/plans from the departments are published in Section 2 of this report.

1.3.2.1 Independent System Verification and Validation of Source Code

The Project Office received reports for all the submitted source code designated for IV&V. The results of this evaluation are summarized in the following chart, *Figure 1.3.2.1-1: Statewide Source Code IV&V Results.*

Department	Lines of Code (LOC) to be Validated	LOC Validated	Potential Errors		Actual Errors	
			Count	Errors per Million LOC	Count	Errors per Million LOC
Corrections	1,001,963	1,001,963	131	131	21	21
Education	520,964	520,964	578	1,109	10	19
Human Services	3,229,030	3,229,030	3,459	1,071	561	174
Judicial	922,524	922,524	618	670	177	192
Labor and Employment	1,627,115	1,627,115	3,178	1,953	594	365
Law	106,472	106,472	71	667	17	160
Natural Resources	440,129	440,129	717	1,629	328	745
Personnel	1,356,695	1,356,695	1,168	861	17	13
Public Health and Environment	98,529	98,529	228	2,314	0	0
Public Safety	988,331	988,331	617	624	307	311
Regulatory Agencies	113,457	113,457	113	996	3	26
Revenue	4,034,235	4,034,235	4,793	1,188	1123	278
Secretary of State	485,857	485,857	32	66	0	0
Transportation	147,692	147,692	275	1,862	214	1,449
STATEWIDE TOTALS	15,072,993	15,072,993	15,978	1,060	3,372	224

Note: All code scheduled for validation has been processed and reviewed by the departments.
Lines of Code (LOC) to be Validated - a count of the lines of code from fatal/critical systems being sent for IV&V.
LOC Validated - a count of the lines of code that have been processed to date by the IV&V vendors and have been reviewed by the department to determine which potential errors are actual errors that need to be fixed.
Potential Errors - The number of lines of code that the vendor identified as having a potential Year 2000 error.
Actual Errors - The number of potential errors that the department determined are actual errors needing to be fixed.

Figure 1.3.2.1-1: Statewide Source Code IV&V Results

The calculation of errors per million lines of code is helpful in comparing a department's error rate against rates of other departments and the overall average for the State. According to the code IV&V vendors, the industry average error rate per million lines of code is between 250 and 350 errors per million lines of code. All of the targeted 15 million lines of code was reviewed. The IV&V process identified 15,978 potential errors, of which, 3,372 (1 in 5) were confirmed as actual errors. This translates to a ratio of 224 errors per million lines of code. This puts Colorado favorably below the industry IV&V average.

1.3.2.2 Independent System Verification and Validation of Processes

The independent evaluation of processes and associated documentation is complete. As this effort completed at a department, process IV&V reports were provided to the Project Office and the department. The reports identified findings and recommendations related to various phases and topics within the system development lifecycle of a Year 2000 project.

The Project Office asked each department to respond to the findings and recommendations within two weeks of report issuance. The Project Office, for analysis and action tracking

purposes, maintains a repository of all findings, recommendations and responses. The results of this evaluation are enumerated in the following chart, *Figure 1.3.2.2-1: Statewide Process IV&V Results*. A summary of the findings, responses and plans for each department can be found in Section 2.2 of this report.

Department	Total Recommendations	Year 2000 Specific Recommendations	Status of Y2K Recommendations		
			No Action Intended	Action Intended	Action Complete
Corrections	45	5	4	0	1
Education	46	26	0	1	25
Human Services	94	49	27	9	13
Judicial	38	11	8	0	3
Labor and Employment	42	23	2	14	7
Natural Resources	43	18	9	8	1
Personnel	105	35	9	4	22
Public Health and Environment	146	46	19	0	27
Public Safety	39	27	15	5	7
Regulatory Agencies	10	5	0	4	1
Revenue	137	63	40	0	23
State	46	23	13	6	4
Transportation	98	28	19	3	6
Agriculture	N/A	0	0	0	0
Governor	N/A	0	0	0	0
Health Care Policy and Financing	N/A	0	0	0	0
Law	N/A	0	0	0	0
Legislature	N/A	0	0	0	0
Local Affairs	N/A	0	0	0	0
Military Affairs	N/A	0	0	0	0
Public Defender	N/A	0	0	0	0
Treasury	N/A	0	0	0	0
STATEWIDE TOTALS	889	359	165	54	140
N/A means that Process IV&V was not in scope for these Departments and, therefore, is not applicable.					

Figure 1.3.2.2-1: Statewide Process IV&V Results

The Independent Verification and Validation of the processes used to repair fatal/critical systems identified several problem areas where improvements in system develop life-cycle practices would be beneficial. These problem areas include:

- Lack of Configuration Management
- Weak test practices
- Lack of business continuity planning
- Lack of emergency response planning
- Ineffective documentation

The Project Office has reviewed the appropriateness of each department's decision to perform, or not perform, additional Year 2000 work in these areas.

1.4 Conclusions

Overall, the State's information technology systems are in good Year 2000 health. A total of 85 projects encompassing 159 fatal and critical impact systems are complete, with objectively verified and acceptable quality results. The Project Office is able to say, with confidence, that fatal/critical impact systems are prepared to process date sensitive data appropriately in the Year 2000.

The only remaining task is to coordinate and conduct year-end rollover weekend activities. Preparations for rollover activities are expected to complete on a timely basis.

This is the last status report of the State of Colorado Year 2000 Project. The next report will be a post-implementation review containing a performance evaluation of the project, a cost analysis and recommendations for future projects.

In summary, the Year 2000 project delivery process employed by the Project Office was both effective and efficient. All fatal and critical impact systems at the State are Year 2000 ready. The Project Office has confidence that there will be no significant Year 2000 problems associated with State information technology systems.

2. Department IV&V Information

2.1 Independent Verification and Validation Status

This section provides a department by department view of the IV&V results. The Project Office determined that to enable the State, its citizens and the departments to reduce their Year 2000 risk that code and process IV&V should be conducted. The code IV&V effort enabled the Project Office to understand that at a point in time, a department's fatal and critical code had a certain number of errors. The process IV&V effort evaluated a department's remediation and testing processes for Year 2000. The process evaluation enabled the Project Office to ascertain if a department could maintain the integrity of the code after the code IV&V activity was completed.

Configuration management is one of the key issues in maintaining code integrity between the time the code is assessed and the century change. The process IV&V also provides an assessment of a department's capability to provide an audit trail of the activities that were performed in their Year 2000 remediation and/or testing. The absence of an audit trail or documentation informs the State that there is no proof that the right things were done correctly in a department's remediation and testing process. A third area examined is the testing. The evaluation of the testing provides the department and the State with information that the department tested what it should have tested and that they properly tested the system. The absence of this evidence can imply that any future changes made to the code may not be tested to ensure that changes did not break another area of the code or that the tests were appropriate for the code changes made.

It is important to note that the code assessment is not by and of itself a strong test that a system will remain Year 2000 compliant. It is an indicator that at the point in time of the assessment, the code was stable (after indicated changes were made and re-tested). If the process evaluation of the system indicates a sound remediation and testing method was followed, then one could assume that the system could reliably be modified and re-tested. Further, in software industry standard terms, the system code was under appropriate configuration management and the tests and remediation processes were appropriate and repeatable.

2.1.1 Interpretation of Code IV&V Results

Each department was required to submit their fatal and critical code to an independent company for review. With very few exceptions, all fatal and critical code was subject to this process. The results for each department are represented in Section 2.2 using the following items.

Lines of Code (LOC) to be Validated - a count of the lines of code from fatal/critical systems being sent for IV&V. This count does not include comment lines contained in the source code.

LOC Validated - a count of the lines of code that have been processed by the IV&V vendor and have been reviewed by the department to determine which potential errors are actual errors.

Potential Errors - Count - this is a count of lines that the IV&V vendor identified as having a potential error. The vendor reports a severity level with each error; however, for the purposes of this report all levels are included in this count.

Potential Errors - Errors per Million LOC - this is a calculated number based upon the Potential Errors Count and the LOC Validated. It provides the number of potential errors for each million lines evaluated and can be used for comparative analysis.

Actual Errors - Count - this is a count of lines that the department, after reviewing all potential errors, identified as having an actual error.

Actual Errors - Errors Per Million LOC - this is a calculated number based upon the Actual Errors Count and the LOC Validated. It provides the number of actual errors for each million lines evaluated and can be used for comparative analysis.

2.1.2 Interpretation of Process IV&V Results

Once a final process IV&V report is created for a department, the Project Office asks the department to respond to the findings and recommendations within two weeks. Section 2.2 addresses the process findings and recommendations for each department and the response and plans related to the findings. The departments are asked to respond to all recommendations, however, for the purposes of this report only the Year 2000 specific recommendations are summarized and tracked for status. The status of a Year 2000 specific recommendation can be assigned one of the following three values:

No Action Intended - assignment to this status could result from one of several circumstances. A department may not agree with the finding and recommendation and decide to do nothing. There may not be sufficient time or resources to address the recommendation or a department may feel the risk is so low that the cost benefit doesn't warrant action. The Project Office will monitor these decisions.

Action Intended - indicates the department intends to take action on the recommendation. The Project Office will monitor the progress of these actions.

Action Complete - shows that the department has completed the recommended action.

2.2 Department Independent Verification and Validation Status and Results

The following sections document the status and results of the IV&V effort at each department.

2.2.1 Agriculture

Risk Analysis (Concerns)

This department has no fatal or critical systems and was, therefore, not subject to the IV&V process. Further, this department is not deemed to present a Year 2000 risk to the State.

Code Review

Findings

Not applicable.

Department Response

Not applicable.

Plans

Not applicable.

Process Review

Findings and Recommendations

Not applicable.

Department Response

Not applicable.

Plans

Not applicable

2.2.2 Corrections

Risk Analysis (Concerns)

The Department has slight risk from the DCIS and Pharmacy systems. The code review indicated no errors for the newly built Pharmacy system and no errors requiring fixes for the DCIS system. The process review recommended additional testing that the Department has chosen not to perform. The Department instituted a code freeze until after the first part of January as recommended by the Project Office. In addition, the Department has done actual Year 2000 rollover exercises.

Code Review

Department of Corrections	
Code IV&V Status	
Lines of Code (LOC) to be Validated	1,001,963
LOC Validated	1,001,963
Potential Errors - Count	131
Potential Errors - Errors Per Million LOC	131
Actual Errors - Count	21
Actual Errors - Errors Per Million LOC	21

Findings

The code review results indicate 131 potential Year 2000 errors.

Department Response

The Department reviewed all of the potential errors and found that 21 potential fatal errors in the DCIS system required fixes to the code.

Plans

The Department plans to correct the 21 actual code errors. The Department has not provided a plan to the Project Office.

Process Review

Department of Corrections					
Process IV&V Status					
Area Reviewed	Total Recommendations	Year 2000 Specific Recommendations	Status of Y2K Recommendations		
			No Action Intended	Action Intended	Action Complete
Department	6	0			
DCIS	13	3	2		1
PHARMACY	26	2	2		
TOTALS	45	5	4	0	1

Findings and Recommendations

In general, the Department had no formally documented Year 2000 approach nor did they have well defined Year 2000 requirements. The Department did test the majority of the circumstances and dates that they should have tested.

Department Response

The Department has decided to upgrade their business processes but not perform recommended additional testing.

Plans

The Department has completed the planned work on the I V & V recommendation.

2.2.3 Education

Risk Analysis (Concerns)

None.

Code Review

Department of Education	
Code IV&V Status	
Lines of Code (LOC) to be Validated	520,964
LOC Validated	520,964
Potential Errors - Count	578
Potential Errors - Errors Per Million LOC	1,109
Actual Errors - Count	10
Actual Errors - Errors Per Million LOC	19

Findings

Vendor findings indicated 578 potential errors in Education's fatal/critical source code. This represented a high error rate per million and was somewhat alarming. After the Department had a chance to review the findings, the error rate dropped drastically, as shown below.

Department Response

Upon analysis of the vendor's findings by the Department, it was determined that only 10 of the potential errors were true errors to be fixed. This calculates to only 19 errors per million lines of code, which is an outstanding achievement. It was discovered that many of the potential errors flagged resulted from an error in the questionnaire completed by the Department. The questionnaire indicated to the vendor that the windowing pivot year was 51, whereas it should have been 50. Therefore, many of the potential errors that were flagged because of pivot year were actually correctly coded. The Department also discovered that a few obsolete modules were sent to the vendor causing some additional non-valid errors.

Plans

The Department was very proactive regarding the IV&V process. They established an IV&V project plan to manage the entire IV&V effort from the inventory phase through the correction of code. The plan execution started in June 1999 and completed in August 1999 with a total of 634 hours of effort expended. The Department also plans to freeze production code for a period before and after January 1 2000.

Process Review

Department of Education					
Process IV&V Status					
Area Reviewed	Total Recommendations	Year 2000 Specific Recommendations	Status of Y2K Recommendations		
			No Action Planned	Action Planned	Action Complete
Department	1	1		1	
FINANCE	8	5			5
FUNDING	8	5			5
HUMAN RESOURCES	11	5			5
SPECIAL EDUC	9	5			5
STUDENT	9	5			5
TOTALS	46	26	0	1	25

Findings and Recommendations

The Year 2000 related findings and recommendations documented during the process review are categorized into three areas. They are:

- 1) Disaster Recovery - Updates to the department level disaster recovery plan should be completed prior to the end of 1999.
- 2) Acceptance Testing - An independent user Year 2000 acceptance test would be beneficial.
- 3) Configuration Management - A review of configuration management controls to ensure stable code maintenance is advised.

Department Response

The Department has responded to the process review recommendations as follows:

- 1) Disaster Recovery - Updates to the disaster recovery plan are being made and will be complete by 12/31/1999.
- 2) Acceptance Testing - The Department agrees that an enhanced user acceptance process would be beneficial.
- 3) Configuration Management - The Department agrees that improvements in configuration management are appropriate.

Plans

The Department has addressed the three primary Year 2000 recommendation areas as follows:

- 1) Disaster Recovery - Updates to the disaster recovery plan are in the process of being made.
- 2) Acceptance Testing - An independent user testing process has been incorporated into the revised customer service request and maintenance tracking procedures.
- 3) Configuration Management - The Department has modified their current manual change control process to include specific responsibilities for moving and testing code/process changes and this process has been tied to annual personnel performance reviews. The Department is also planning to automate the Customer Service Request (CSR) process and to create an ongoing maintenance project to track repetitive and new system changes.

2.2.4 Governor

Risk Analysis (Concerns)

This department has no fatal or critical systems and was, therefore, not subject to the IV&V process. Further, this department is not deemed to present a Year 2000 risk to the State.

Code Review

Findings

Not applicable.

Department Response

Not applicable.

Plans

Not applicable.

Process Review

Findings and Recommendations

Not applicable.

Department Response

Not applicable.

Plans

Not applicable

2.2.5 Health Care Policy and Financing

Risk Analysis (Concerns)

As of the current reporting period, the Project Office believes the risk of Year 2000 failure at the department is minimal.

The Department replaced an aging non-compliant system with a modern compliant Medicare Medicaid Information System (MMIS) currently in use by many other states to pay benefits. The Department underwent IV&V activity sponsored by the U.S. Health Care Financing Administration (HCFA) on various occasions over the past year. The Department was rated low risk for Year 2000 problems by HCFA in August 1999.

The final step of the HCFA sponsored activity was an "end-to-end" test of service delivery. This test completed successfully in September 1999. The successful conclusion of this test ends Project Office activity concerning this department.

Code Review

Findings

Not applicable. The Consultech Medicaid/Medicare payment management system is vendor owned and maintained software and not subject to Project Office requirement for code review.

Department Response

Not applicable.

Plans

Not applicable.

Process Review

The Project Office did not conduct process IV&V at the Department of HCP&F. The reason for this is that the federal HCFA organization conducted its own IV&V process at the Department.

Findings and Recommendations

The HCFA recommended an end-to-end test of service delivery. The test should be designed to demonstrate the ability of the participating jurisdictions (city, county, State and Federal) to work with the MMIS system during Year 2000 and beyond.

Department Response

The Department agreed to act on the HCFA recommendations and conducted an end to end test of service delivery. This test was completed in September 1999.

Plans

None. The test was successfully completed.

2.2.6 Human Services

Risk Analysis (Concerns)

Post IV&V activity at the Department is nearing completion and the results are positive. The large customer service systems ACSES, CAFSS and COIN are in good shape.

IV&V follow-up activities for CWEST, COFRS Interface, EBT and Leap are proceeding on schedule for completion prior to December 31, 1999. Plans regarding test criteria for the Rehabilitation system are complete.

Code Review

Department of Human Services	
Code IV&V Status	
Lines of Code (LOC) to be Validated	3,229,030
LOC Validated	3,229,030
Potential Errors - Count	3,459
Potential Errors - Errors Per Million LOC	1,071
Actual Errors - Count	561
Actual Errors - Errors Per Million LOC	174

Findings

The scope of the code review includes 8 fatal and critical impact systems; reviewed in two phases. Phase 1 included the ACSES, COIN, CAFSS systems and Phase 2 included the CWEST, COFRS Interfaces, EBT, LEAP and Rehabilitation systems. The vendor has completed analysis on all fatal and critical impact code (3,229,030 lines) and found 3,459 potential errors.

Department Response

The Department has interpreted all vendor results. The Department found, and reported to the Project Office, 561 actual Year 2000 errors from the 3,459 potential error situations identified in the vendor results. This translates to an actual error rate of 174 Year 2000 errors per million lines of fatal or critical impact production code. This error rate is below the expected range (250-350 actual errors/MLOC).

Plans

The Department reports that they have fixed and tested all errors identified by the code review.

Process Review

Department of Human Services					
Process IV&V Status					
Area Reviewed	Total Recommendations	Year 2000 Specific Recommendations	Status of Y2K Recommendations		
			No Action Intended	Action Intended	Action Complete
Department	3	1			1
ACSES	12	7	5		2
CAFSS	24	14	8		6
COFRS INTERFACE	4	2	1		1
COIN	14	5	5		
CWEST	7	6	1	3	2
EBTS	5	4	4		
LEAP	11	3	3		
VOC REHAB	14	7		6	1
TOTALS	94	49	27	9	13

Findings and Recommendations

The scope of the process review includes 8 fatal and critical impact systems: ACSES, COIN, CAFSS, CWEST, COFRS Interfaces, EBT, LEAP and Rehabilitation systems. There are 5 major areas of findings.

- 1) Contingency Plans - Department-wide business continuity planning needs additional work. Current business continuity plans are incomplete, stored in unpublished locations or for various reasons will be rendered ineffective. ACSES, COIN, CAFSS, CWEST, COFRS Interfaces, EBT, LEAP and Rehabilitation systems received specific findings in this area.
- 2) Configuration Management - The Department needs to improve the configuration management of production source code and the various elements (scripts, cases, outcomes, signoffs, etc.) of the test process. The major purpose of this finding was to prevent errors being reintroduced to now compliant systems and allow easy identification and removal of any reintroduced errors resulting from maintenance activity between now and the December 31 1999.
- 3) Acceptance Testing/Additional Testing - Phase 1 systems need to formalize user acceptance testing of the systems and confirm system specific critical Year 2000 dates for testing. Various levels of technical testing were done to ensure the technical performance of the project met the Information Technology Group (ITG) perception of what was required. Logicon recommended that confirmation of this perception with the users or customers of the system would benefit from formalization. Additional testing was recommended on a number of smaller but high impact systems COFRS Interfaces, CWEST, EBT and Rehabilitation.

- 4) Critical Year 2000 test dates - The selection of these critical dates did not conform to the list of generally accepted dates used by Logicon as the standard for their IV&V method. Julian date handling arose as a problem area in ACSES as a result of the code review results.
- 5) Test Criteria - Strictly define compliance criteria to enable deterministic compliance testing. This recommendation applied mainly to the smaller systems COFRS Interfaces, CWEST, EBT and Rehabilitation.

Department Response

- 1) Contingency Plans - The Director of Operations for CDHS reports that necessary contingency and business continuity plans are complete and on hand in his office. He confirms that these plans are considered adequate by the Department and require no further work or updates. This response applies to all 8 application systems areas.
- 2) Configuration Management - The Department agrees with these recommendations and in addition to freezing the current code between November 29 1999 and January 7 2000 plans to review and update configuration management for the existing and new applications. This response applies to all 8 application systems areas.
- 3) Acceptance Testing/Additional Testing - The Department will review and update User Acceptance Testing Methods on a department-wide basis. Testing activity on COFRS Interfaces, EBT, CWEST, Rehabilitation and LEAP is complete.
- 4) Critical Year 2000 test dates - The selection of these critical dates did not conform to the list of generally accepted dates used by Logicon as the standard for their IV&V method. Julian date handling arose as a problem area in ACSES as a result of the code review results. Information regarding testing activity on COFRS Interfaces, EBT, CWEST, Rehabilitation and LEAP is complete or will complete prior to December 31,1999.
- 5) Test Criteria - Strictly define compliance criteria to enable deterministic compliance testing. These recommendations applied primarily to the COFRS Interfaces, CWEST, EBT, LEAP and Rehabilitation systems. Activities are underway COFRS Interfaces, CWEST, EBT, Rehabilitation and LEAP.

Plans

- 1) Contingency Plans - The Director of Operations for CDHS reports that necessary contingency and business continuity plans are on hand in his office. He confirms that these plans are considered adequate by the Department and require no further work or updates. No action intended.
- 2) Configuration Management - The Department plans to review and update configuration management for the existing and new applications. This review is currently underway with recommendations for updates to the configuration management process due after the planned code freeze ends on January 7 2000.
- 3) Acceptance Testing/Additional Testing - The Department plans to review and update User Acceptance Testing Methods on a department-wide basis. With respect to ACSES, COIN and CAFSS, work on this effort is underway with draft results planned

to be available immediately upon the conclusion of the Year 2000 code freeze on January 7 1999. Plans regarding testing activity on COFRS Interfaces, EBT, CWEST, Rehabilitation and LEAP are complete.

- 4) Critical Year 2000 test dates - The selection of these critical dates did not conform to the list of generally accepted dates used by Logicon as the standard for their IV&V method. Julian date handling arose as a problem area in ACSES as a result of the code review results. The Department plans to completed plans to test month end Julian date testing on ASCES as of December 15 1999. Plans regarding test criteria and test dates on COFRS Interfaces, EBT, CWEST, LEAP are underway and on schedule to complete prior to December 31 1999. Plans regarding the test of critical Year 2000 dates for the Rehabilitation system are complete
- 5) Test Criteria - Strictly define compliance criteria to enable deterministic compliance testing. . These recommendations apply primarily to the COFRS Interfaces, CWEST, EBT, LEAP and Rehabilitation systems. Plans regarding the to the COFRS Interfaces, CWEST, EBT, LEAP systems are on track to complete before December 24 1999. Plans regarding test criteria for the Rehabilitation system are complete

2.2.7 Judicial

Risk Analysis (Concerns)

None.

Code Review

Judicial Department	
Code IV&V Status	
Lines of Code (LOC) to be Validated	922,524
LOC Validated	922,524
Potential Errors - Count	618
Potential Errors - Errors Per Million LOC	670
Actual Errors - Count	177
Actual Errors - Errors Per Million LOC	192

Findings

Vendor findings indicated 618 potential errors in the Judicial Department's fatal/critical source code. Many of the potential errors were a result of windowing pivot years that did not match the Department's standard.

Department Response

The Department determined that 177 of the potential errors actually needed to be fixed. Most of these were to standardize the pivot year being used for windowing logic. The potential errors that did not need fixing were either coded correctly for the application or the result of some non-production source programs being included in the inventory.

Plans

The Department has made the code corrections and has re-tested the corrected modules.

Process Review

Judicial Department					
Process IV&V Status					
Area Reviewed	Total Recommendations	Year 2000 Specific Recommendations	Status of Y2K Recommendations		
			No Action Intended	Action Intended	Action Complete
Department	5	2			2
A&S	21	8	8		
ICON	12	1			1
TOTALS	38	11	8	0	3

Findings and Recommendations

The Year 2000 related findings documented during the process review are categorized into three areas. They are:

- 1) Department Disaster Recovery Plan - The Department should complete and rehearse contingency and disaster recovery plans prior to December 31 1999.
- 2) ICON Contingency Plan - Enhance the ICON system contingency plan by including available manual procedures.
- 3) A&S Processes - Improve the software configuration management and testing processes for the Alimony and Support (A&S) system.

Department Response

- 1) Department Disaster Recovery Plan - The Department agrees that the Department's contingency and disaster recovery plans should be enhanced.
- 2) ICON Contingency Plan - The Department will incorporate the manual processes as part of the ICON contingency plan.
- 3) A&S Processes - The Alimony and Support system is being replaced with plans for the remaining districts to be converted off A&S by the first quarter of calendar Year 2000. Manual processes are in place at the remaining districts should problems arise.

Plans

- 1) Department Disaster Recovery Plan - The plan was completed in November 1999.
- 2) ICON Contingency Plan - The manual processes have been incorporated into ICON's contingency plan.
- 3) A&S Processes - The Department made a business decision to not address the recommendations for the Alimony and Support system. Since the system will be retired within the first few months of Year 2000 and contingency plans exist to address failures, it was felt that the effort to address the recommendations was not justifiable.

2.2.8 Labor and Employment

Risk Analysis (Concerns)

A larger than expected number of errors were found in the Colorado Automated Unemployment Tax System (CATS) during the code IV&V. The Department analyzed the results, made corrections and the corrected programs were processed by the code IV&V vendor a second time. Only 8 actual errors were discovered during the second IV&V process and the Department has made corrections and will retest. The original concern with CATS has diminished as a result of these actions.

Code Review

Department of Labor and Employment	
Code IV&V Status	
Lines of Code (LOC) to be Validated	1,627,115
LOC Validated	1,627,115
Potential Errors - Count	3,178
Potential Errors - Errors Per Million LOC	1,953
Actual Errors - Count	594
Actual Errors - Errors Per Million LOC	365

Findings

The IV&V vendor flagged 3,178 potential errors. This was much higher than anticipated. The majority of the errors were attributed to the CATS system. The number of errors in CATS dropped considerably during the second IV&V process.

Department Response

After reviewing all of the potential errors, the Department found that the number of true errors was 594, which translates to 365 errors per million lines of code. This number is slightly higher than the industry average of 250 - 350 lines per million. The majority of the actual errors were in the CATS system and the Department was able to determine that a portion of the errors was related to a Production move that did not complete successfully.

Plans

The Department had IV&V performed on the corrected programs from the CATS system. The Department has corrected all the actual errors and has started a re-testing effort.

Process Review

Department of Labor and Employment					
Process IV&V Status					
Area Reviewed	Total Recommendations	Year 2000 Specific Recommendations	Status of Y2K Recommendations		
			No Action Planned	Action Planned	Action Complete
Department	7	5	1	1	3
CATS	4	3		2	1
CUBS	4	4		3	1
FARS	6	2		2	
ODDS/ENDS	16	7	1	4	2
WORKERS COMP	5	2		2	
TOTALS	42	23	2	14	7

Findings and Recommendations

The majority of the findings/recommendations uncovered during the process review are categorized into five areas. They are:

- 1) Published compliance statement - The Department needs a published statement defining Year 2000 compliance and it should be communicated to all system areas.
- 2) Business continuity planning - Business continuity planning should be finalized with input from each of the system areas.
- 3) Configuration Management - Configuration management should be improved through enhanced procedures or additional tools.
- 4) Acceptance testing - User acceptance testing should be improved by developing more comprehensive test scripts.
- 5) Additional testing - Additional acceptance testing should be conducted utilizing the Year 2000 LPAR at the Data Center.

Department Response

The Department has responded to the IV&V findings. The responses to the major finding categories follows:

- 1) Published compliance statement - The Department feels they adequately defined Year 2000 compliance and, given that the projects are essentially complete, does not see validity in providing additional compliance statements.
- 2) Business continuity planning - The Department agrees that additional contingency planning is needed.
- 3) Configuration Management - The Department agrees that configuration management, as well as standardized system development methodologies, should be enhanced.
- 4) Acceptance testing - The Department agrees that testing procedures and better test scripts should be developed.
- 5) Additional testing - The Department agrees that additional Year 2000 testing should be conducted.

Plans

The Department has plans to address the five major finding categories:

- 1) Published compliance statement - The Department feels they had a sufficient compliance statement and, since their projects are complete, do not feel that a modified statement is necessary.
- 2) Business continuity planning - Contingency planning is currently being developed with the business areas leading the effort.
- 3) Configuration Management - The Department is currently developing a "Methodologies and Procedures" document that will include procedures for configuration management. The Project Office has received a 117-page draft of this document.
- 4) Acceptance testing - The Department is currently developing and standardizing a structured approach to testing. The Project Office has received a 31-page draft of this document. The process of documenting and using test scripts is addressed in this document.
- 5) Additional testing - the Department had planned to perform additional testing prior to the IV&V recommendation to do so. The Department is currently performing additional Year 2000 testing of their fatal/critical systems.

2.2.9 Law

Risk Analysis (Concerns)

None.

Code Review

Department of Law	
Code IV&V Status	
Lines of Code (LOC) to be Validated	106,472
LOC Validated	106,472
Potential Errors - Count	71
Potential Errors - Errors Per Million LOC	667
Actual Errors - Count	17
Actual Errors - Errors Per Million LOC	160

Findings

The Department submitted their fatal and critical code for IV&V. The results were favorable.

Department Response

The Department analyzed the results and determined they had to fix 17 actual errors.

Plans

The Department has completed their code fixes and testing.

Process Review

Findings and Recommendations

The Project Office determined that it wasn't cost effective to conduct a process review of the Attorney General's office. The systems were deemed fatal or critical to the Department's activities, but pose no threat to public safety, have no federal interfaces or have no substantial revenue impact to the State.

Department Response

Not applicable.

Plans

Not applicable.

2.2.10 Legislature

Risk Analysis (Concerns)

This department has no fatal or critical systems and was, therefore, not subject to the IV&V process. Further, this department is not deemed to present a Year 2000 risk to the State.

Code Review

Findings

Not applicable.

Department Response

Not applicable.

Plans

Not applicable.

Process Review

Findings and Recommendations

Not applicable.

Department Response

Not applicable.

Plans

Not applicable.

2.2.11 Local Affairs

Risk Analysis (Concerns)

This department has no fatal or critical systems and was, therefore, not subject to the IV&V process. Further, this department is not deemed to present a Year 2000 risk to the State.

Code Review

Findings

Not applicable.

Department Response

Not applicable.

Plans

Not applicable.

Process Review

Findings and Recommendations

Not applicable.

Department Response

Not applicable.

Plans

Not applicable.

2.2.12 Military Affairs

Risk Analysis (Concerns)

This department has no fatal or critical systems and was, therefore, not subject to the IV&V process. Further, this department is not deemed to present a Year 2000 risk to the State.

Code Review

Findings

Not applicable.

Department Response

Not applicable.

Plans

Not applicable.

Process Review

Findings and Recommendations

Not applicable.

Department Response

Not applicable.

Plans

Not applicable.

2.2.13 Natural Resources

Risk Analysis (Concerns)

The Department reports that progress on contingency planning is on track to complete prior to December 31, 1999. This lowers the risk profile of the department.

The Project Office has no information about the test results of the Departments remedial code fixes resulting from IV&V activity. The Project Office also has no information about Department intentions to implement a source code freeze since IV&V code repairs have been completed. Without information on these two areas the Department may retain a moderate amount of Year 2000 risk.

Code Review

Department of Natural Resources	
Code IV&V Status	
Lines of Code (LOC) to be Validated	440,129
LOC Validated	440,129
Potential Errors - Count	717
Potential Errors - Errors Per Million LOC	1,629
Actual Errors - Count	328
Actual Errors - Errors Per Million LOC	745

Findings

The scope of the code review included 3 fatal and critical impact systems analyzed in 3 work packages. The code review effort began in early August 1999. The vendor has completed analysis on all 440,129 lines of fatal and critical impact code and found 717 potential errors.

Department Response

The Department has interpreted the vendor results and reports 328 actual code errors from the 717 potential error. This translates to an actual error rate of 745 per million lines of code. The expected range for Year 2000 coding errors is 250-350 actual errors/MLOC. This finding indicates problems with the process of IT service delivery within the Department. In the opinion of the Project Office the Department's ability to adequately test these errors, after correction, is uncertain.

Plans

The Department reported in October that it had fixed all code errors identified by the Code Review.

Process Review

Department of Natural Resources					
Process IV&V Status					
Area Reviewed	Total Recommendations	Year 2000 Specific Recommendations	Status of Y2K Recommendations		
			No Action Intended	Action Intended	Action Complete
Department	3	1		1	
COGIMS	11	8	7		1
CORIS	10	6	2	4	
SLIMS	19	3		3	
TOTALS	43	18	9	8	1

Findings and Recommendations

The scope of the process review included the State Land Board, Colorado Oil and Gas Commission, and Division of Wildlife systems.

Findings were grouped by level into Department level findings and system level findings. The only Departmental level finding requiring a Year 2000 related recommendation was the absence of business continuity plans or emergency readiness plans.

The system level findings included 3 fatal and critical impact systems in scope. The findings resulted in 43 recommendations of which 18 had Year 2000 significance. The recommendations fall into 4 areas.

- 1) Critical Dates - The Department needs to define and test additional Year 2000 related critical dates. (3 recommendations)
- 2) Additional Testing - The Department needs to carry out additional formal Year 2000 testing. (11 recommendations)
- 3) Contingency Planning - The Department needs to create and exercise business continuity plans (3 recommendations).
- 4) Configuration Management - The Department needs to remove obsolete source code from the production source code library (1 recommendation).

Department Response

- 1) Critical Dates - Define and test additional Year 2000 related critical dates. The department plans action on 2 of 3 recommendations.
- 2) Additional Testing - Carry out additional formal Year 2000 testing. The Department plans action on 5 of 11 recommendations.
- 3) Contingency Planning - Create and exercise business continuity plans. The Department plans action on 2 of 3 recommendations.
- 4) Configuration Management - The Department needs to remove obsolete source code from the production source code library. The department plans no action on this 1 recommendation.

Plans

Detailed plans on the various findings and recommendations areas detailed above were not made available by the Department. In November, the Department reported they planned to complete their intended actions prior to December 31 1999. As of publication time, the Department reports that they are on schedule to complete as planned.

2.2.14 Personnel

Risk Analysis (Concerns)

The code IV&V for all of Personnel has not produced any concerns. The process IV&V for COFRS, Payroll and Benefits systems indicates no serious concerns. The process IV&V for the Data Center indicated some level of risk, however the Data Center has aggressively completed their remaining testing, procedures and contingency planning to minimize any potential risk. The Data Center has done an excellent job of developing Year 2000 rollover scenarios and responses, planning and training.

Code Review

Department of Personnel	
Code IV&V Status	
Lines of Code (LOC) to be Validated	1,356,695
LOC Validated	1,356,695
Potential Errors - Count	1,168
Potential Errors - Errors Per Million LOC	861
Actual Errors - Count	17
Actual Errors - Errors Per Million LOC	13

Findings

The Department had 1,168 potential code errors.

Department Response

After reviewing the potential code errors, the Department fixed 17 actual errors. The majority of the potential errors reported were in vendor code that is not used.

Plans

The Department has made the required changes.

Process Review

Department of Personnel					
Process IV&V Status					
Area Reviewed	Total Recommendations	Year 2000 Specific Recommendations	Status of Y2K Recommendations		
			No Action Intended	Action Intended	Action Complete
CITS	56	19		2	17
COFRS	30	10	6	1	3
CPPS/EBS	19	6	3	1	2
TOTALS	105	35	9	4	22

Findings and Recommendations

The findings and recommendations are as follows:

- 1) Published statement of Year 2000 compliance - The Department needs a published statement defining Year 2000 compliance and it should be communicated to all system areas.
- 2) Update CAG for the tracking table - Update the COFRS Administrative Guide (CAG) for the tracking table used for change management of the Year 2000 software changes.
- 3) Update CAG for current processes.
- 4) Software audit trail documentation - Collect all pertinent purchased software audit trail documentation and re-test, if necessary.
- 5) Test scripts and test hardware microcode - Develop test scripts and test Hardware containing microcode.
- 6) Update test processes - Update test process to include test plans, test scripts and test results reports.
- 7) Develop an escalation process - Develop an escalation process and coordinate with each vendor.
- 8) Develop application priorities - Work with customer/departments to verify fatal/critical applications, priorities and develop emergency escalation procedures.
- 9) Develop contingency plan triggers - Clearly identify triggers that will activate the contingency plan, train staff and walk through the plan.

Department Response

- 1) Published statement of Year 2000 compliance - The Department will review for appropriateness.
- 2) Update CAG for the tracking table - The Department will review the CAG and determine if it will update it.
- 3) Update CAG for current processes - The Department will review the CAG and determine if it will update it.
- 4) Software audit trail documentation - The Department has prioritized the software and is in the process of re-testing the software.
- 5) Test scripts and test hardware microcode - The Department has developed a plan and is in process of compliance.
- 6) Update test processes - The Department has complied.
- 7) Develop an escalation process - The Department is working with its vendors to develop an escalation process.
- 8) Develop application priorities - The Department has requested the information from each of its department/customers.

- 9) Develop contingency plan triggers - The Department is upgrading its contingency plan and will conduct a walk-through and train the appropriate staff.

Plans

- 1) Published statement of Year 2000 compliance - The Department has not decided when this review will happen.
- 2) Update CAG for the tracking table - The Department has not decided when this review will happen.
- 3) Update CAG for current processes - The Department has not decided when this review will happen.
- 4) For items 4 through 9 at the Data Center, the Data Center expects all items to be complete by 12/15/1999. As of publication, the Data Center was completing their final training and escalation process for the rollover weekend.

2.2.15 Public Defender

Risk Analysis (Concerns)

This department has no fatal or critical systems and was, therefore, not subject to the IV&V process. Further, this department is not deemed to present a Year 2000 risk to the State.

Code Review

Findings

Not applicable.

Department Response

Not applicable.

Plans

Not applicable.

Process Review

Findings and Recommendations

Not applicable.

Department Response

Not applicable.

Plans

Not applicable.

2.2.16 Public Health and Environment

Risk Analysis (Concerns)

None.

Code Review

Department of Public Health & Environment	
Code IV&V Status	
Lines of Code (LOC) to be Validated	98,529
LOC Validated	98,529
Potential Errors - Count	228
Potential Errors - Errors Per Million LOC	2,314
Actual Errors - Count	0
Actual Errors - Errors Per Million LOC	0

Findings

The code review at Public Health is complete. There were 228 lines of code identified as having potential errors. This translates to 2,314 potential errors per million lines of code.

Department Response

After reviewing the 228 lines containing potential errors, the department determined that none of the lines contained errors needing correction. The Department stated that, "The errors that were detected fall into three categories: obsolete programs used to convert old data from a two digit year to a four digit year; programs used to convert incoming data from a two digit year format to a four digit year format; and programs to reformat data to a two digit year format for events prior to 1999 due to specifications from our user agencies."

Plans

No actual code changes were needed as a result of the IV&V code review. The Department plans a freeze of fatal and critical code between December 1 1999 and January 30 2000.

Process Review

Department of Public Health and Environment					
Process IV&V Status					
Area Reviewed	Total Recommendations	Year 2000 Specific Recommendations	Status of Y2K Recommendations		
			No Action Intended	Action Intended	Action Complete
Department	20	7			7
CPD - SPIF/CDMS	28	8			8
DCEED - MEDIVAX	35	19	19		
HCP - IRIS	24	8			8
HSVR - BIRTHS	19	1			1
WOCD - WATER	20	3			3
TOTALS	146	46	19	0	27

Findings and Recommendations

The independent process review effort at Public Health is complete. The vendor reviewed the Department and five fatal/critical systems. There were 46 Year 2000 related recommendations generated from the review. These recommendations can be categorized into the following five areas:

- 1) Year 2000 Compliance Statement - The Department should develop a written statement defining the criteria for Year 2000 compliance at the Department.
- 2) Business Continuity Plan - The Department should document and test a business continuity plan for each fatal/critical system to ensure continued business operations in the event of a Y2K related system failure.
- 3) External Interfaces - Document and analyze data interfaces with external organizations and sign interface agreements to confirm Y2K compliant interface specifications.
- 4) Vendor Letters - Acquire letters or documentation certifying Y2K compliance from vendors of COTS hardware and software used by the Department.
- 5) Acceptance Testing - Enhance the acceptance testing function by improving the documentation of test plans, test scripts, and user signoffs.
- 6) DCEED Medivax system - There were a large number of findings and recommendations related to the Medivax system. Please see the Department's response for more detail.

Department Response

- 1) Year 2000 Compliance Statement - The Department agrees to prepare a standard compliance statement and furnish it to all project managers.
- 2) Business Continuity Plan - The Department agrees to create business continuity plans.
- 3) External Interfaces - The Department agrees to complete interface specification agreements for critical system exchange partners.
- 4) Vendor Letters - The Department has requested vendor certification letters.

- 5) Acceptance Testing - The Department agrees to test and document the remaining areas.
- 6) DCEED Medivax system - This system may have been erroneously classified as fatal by the Department during the inventory phase. The new Medivax system is a small Microsoft Access database application, which was written by a contractor in less than 80 hours. It is meant to replace an existing manual process. The level of documentation was low because of the limited availability of funding and resources. Please see the plans below.

Plans

- 1) Year 2000 Compliance Statement - A compliance statement has been furnished to all project managers.
- 2) Business Continuity Plan - All Department divisions completed business continuity plans in November 1999.
- 3) External Interfaces - The Department has completed interface specification agreements.
- 4) Vendor Letters - The Department has notified all vendors and will continue to monitor the receipt of vendor certification letters.
- 5) Acceptance Testing - The Department completed the acceptance testing activities in November 1999.
- 6) DCEED Medivax system - Because of a lack of resources, the Department will continue using the manual process and will document and test the new system, as resources are available. This may or may not be completed by the end of 1999. The Project Office feels that continuing with the manual system while the new system is documented and tested will not present a Year 2000 risk. Therefore, the 19 Y2K-related recommendations for Medivax will be recorded as "No Action Intended" from a Year 2000 perspective.

2.2.17 Public Safety

Risk Analysis (Concerns)

The Year 2000 Project Office has met with the Department on several occasions to discuss their risk from non-remediated code. The Department has agreed to remove all obsolete and non-remediated code and disable non-fatal and critical applications from the CBI computer prior to the Year 2000 rollover event. This will greatly reduce their risk of a Year 2000 failure. The Department will remediate and test this code after the first part of January before returning the disabled applications to production. The Project Office and the Department believe that these actions will reduce the likelihood of a Year 2000 failure.

Code Review

Department of Public Safety	
Code IV&V Status	
Lines of Code (LOC) to be Validated	988,331
LOC Validated	988,331
Potential Errors - Count	617
Potential Errors - Errors Per Million LOC	624
Actual Errors - Count	307
Actual Errors - Errors Per Million LOC	311

Findings

There were 617 potential errors out of 988,331 lines of reviewed code at the Department.

Department Response

The Department determined that 307 of the 617 potential errors required fixing. This translates to an error rate of 311 per million lines of code.

Plans

The Department reports that 118 of the 307 actual errors have been corrected. The remaining 189 errors will be fixed after January 1 2000. The application areas that contain the 189 errors are considered non-fatal and will be disabled until the errors are corrected.

Process Review

Department of Public Safety					
Process IV&V Status					
Area Reviewed	Total Recommendations	Year 2000 Specific Recommendations	Status of Y2K Recommendations		
			No Action Intended	Action Intended	Action Complete
Department	8	7	2	3	2
CCIC	17	10	7	1	2
CICJIS	14	10	6	1	3
TOTALS	39	27	15	5	7

Findings and Recommendations

The findings and recommendations are as follows:

- 1) Published statement of Year 2000 compliance - The Department needs a published statement defining Year 2000 compliance and it should be communicated to all system areas.
- 2) Year 2000 failure analysis – The Department needs to develop and document a Year 2000 failure analysis that identifies the potential impact of Year 2000 failure on its' customers, other Departments and its' own critical business processes.
- 3) Complete comprehensive inventory – The Department needs to complete its inventory and track Year 2000 compliance of the inventory
- 4) Develop Year 2000 program plan for any remaining activities.
- 5) Identify and eliminate obsolete software from production system.
- 6) Remediate and test software not previously remediated for Year 2000.
- 7) Develop a business continuity plan.
- 8) Develop and document a test plan, schedule and scripts for remaining Year 2000 test activities and involve the user in the planning and execution.
- 9) Ensure that test coverage was adequate on previously executed tests.
- 10) For new or remaining Year 2000 test activity, document test criteria, actual test cases performed and test results.

Department Response

- 1) Published statement of Year 2000 compliance - The Department will make a determination of whether further testing will be done via a risk analysis. Any new or remaining remediation or validation activity will follow guidelines.
- 2) Year 2000 failure analysis – The Department will assess and integrate with their contingency plan.
- 3) Complete comprehensive inventory – The Department will make the inventory available.

- 4) Develop Year 2000 program plan for any remaining activities – The Department will revise their plan based on the CCIC and CICJIS IV&V analysis.
- 5) Identify and eliminate obsolete software from production system – The Department will follow this recommendation.
- 6) Remediate and test software not previously remediated for Year 2000 – The Department will fix IV&V code errors. Management will make a determination of whether further testing will be done based on results from a risk analysis.
- 7) Develop a business continuity plan – the Department will prepare a business continuity plan.
- 8) Develop and document a test plan, schedule and scripts for remaining Year 2000 test activities and involve the user in the planning and execution – management will make a determination of whether further testing will be done through a risk analysis. Any new or remaining remediation or validation activity will follow guidelines.
- 9) Ensure that test coverage was adequate on previously executed tests – the Department is confident that the date processing was all encompassing and does not anticipate further work.
- 10) For new or remaining Year 2000 test activity, document test criteria, actual test cases performed and test results – the Department will make a determination of whether further testing and hence documentation is required.

Plans

- 1) Published statement of Year 2000 compliance - The Department has no immediate plans, but will assess the need for further Year 2000 efforts.
- 2) Year 2000 failure analysis – The Department will assess and integrate with their contingency plan.
- 3) Complete comprehensive inventory – The Department has completed the inventory.
- 4) Develop Year 2000 program plan for any remaining activities – The Department will revise their plan based on the CCIC and CICJIS IV&V analysis.
- 5) Identify and eliminate obsolete software from production system – The Department is in the process of complying with this recommendation.
- 6) Remediate and test software not previously remediated for Year 2000 – The Department will fix IV&V code errors after the first of January and before leap year. Management will make a determination of whether further testing will be done based on results from a risk analysis.
- 7) Develop a business continuity plan – the Department reports that this is complete.
- 8) Develop and document a test plan, schedule and scripts for remaining Year 2000 test activities and involve the user in the planning and execution – there are no immediate plans for this recommendation.
- 9) Ensure that test coverage was adequate on previously executed tests – the Department is confident that the date processing was all encompassing and does not anticipate further work.

10) For new or remaining Year 2000 test activity, document test criteria, actual test cases performed and test results – there are no immediate plans for this recommendation.

2.2.18 Regulatory Agencies

Risk Analysis (Concerns)

None.

Code Review

Department of Regulatory Agencies	
Code IV&V Status	
Lines of Code (LOC) to be Validated	113,457
LOC Validated	113,457
Potential Errors - Count	113
Potential Errors - Errors Per Million LOC	996
Actual Errors - Count	3
Actual Errors - Errors Per Million LOC	26

Findings

Vendor findings indicated 113 potential errors in the fatal/critical source code analyzed for Regulatory Agencies.

Department Response

Only three of the 113 potential errors were actual errors requiring correction. The large variance between the count of potential errors and actual errors is due to the majority of potential errors being classified as "Reviewer" type errors. Reviewer errors are less likely to be true errors than the other category of "Action" errors. Once the Department reviewed the potential errors, they only found 3 actual errors to be corrected.

Plans

The Department has corrected the three errors.

Process Review

Department of Regulatory Agencies					
Process IV&V Status					
Area Reviewed	Total Recommendations	Year 2000 Specific Recommendations	Status of Y2K Recommendations		
			No Action Intended	Action Intended	Action Complete
Department	1	1			1
BANKING	3	1		1	
ELECT & PLUMBING	2	1		1	
INSURANCE	2	1		1	
PUC OP RIGHTS	2	1		1	
TOTALS	10	5	0	4	1

Findings and Recommendations

The Year 2000 related findings documented during the process review at Regulatory Agencies can be categorized into two areas. They are:

- 1) Business Continuity Plan - The Department should document and test a business continuity plan for each fatal/critical system to ensure continued business operations in the event of a Y2K related system failure.
- 2) Additional Testing - The Department should do additional Y2K testing to include a test for 3/1/2000.

Department Response

- 1) Business Continuity Plan - The Department has started and will complete a business continuity plan.
- 2) Additional Testing - The Department feels that 3/1/2000 is not applicable for their fatal/critical systems. They do feel it would be advantageous to test this date on their Application Server.

Plans

- 1) Business Continuity Plan - A business continuity plan was completed in November 1999.
- 2) Additional Testing - A test of 3/1/2000 will be performed on the Department's Application Server by the first part of December 1999.

2.2.19 Revenue

Risk Analysis (Concerns)

The Department reports they have completed the fix and test of the Lottery code errors, contingency planning activities, all intended actions in response to IV&V recommendations and the implementation of a department wide code freeze effective December 13, 1999.

Code Review

Department of Revenue	
Code IV&V Status	
Lines of Code (LOC) to be Validated	4,034,235
LOC Validated	4,034,235
Potential Errors - Count	4,793
Potential Errors - Errors Per Million LOC	1,188
Actual Errors - Count	1,123
Actual Errors - Errors Per Million LOC	278

Findings

The scope of the code review included all Department lines of business which included, 16 fatal and critical impact systems analyzed in 7 work packages. The vendor has completed analysis on all 4,034,235 lines of fatal and critical impact code and found 4,793 potential errors.

Department Response

The Department has interpreted the vendor findings of 4,793 potential errors. They have found and reported to the Project Office that 1,123 actual Year 2000 errors exist within the 4,793 potential errors.

The current findings indicate an actual error rate of 278 Year 2000 errors per million lines of fatal and critical impact production code. This error rate is within the expected range (250-350 actual errors/MLOC).

Plans

The Department reports it has completed fixing all actual code errors, including Lottery, prior to the planned December 13 1999 code freeze. The Department has implemented a policy of freezing their production software configuration from December 13 1999 through January 5 2000 to ensure all corrections are in force during the century change.

Process Review

Department of Revenue					
Process IV&V Status					
Area Reviewed	Total Recommendations	Year 2000 Specific Recommendations	Status of Y2K Recommendations		
			No Action Intended	Action Intended	Action Complete
Department	10	7	3		4
INCOME TAX	31	17	14		3
LOTTERY	29	12	2		10
TAX - LOB	40	17	15		2
TRANSP/ENFORCE	27	10	6		4
TOTALS	137	63	40	0	23

Findings and Recommendations

The scope of the process review included all lines of Department business.

The findings resulted in 137 recommendations of which 63 had Year 2000 significance. The majority of the recommendations were found in 4 topic areas.

- 1) Contingency planning - The need for department and business area contingency planning (10 recommendations)
- 2) Configuration management - Implement software configuration management, preferably with an automated tool, and remove obsolete source code from the now Year 2000 compliant system libraries(6 recommendations)
- 3) Test planning - Create necessary testing documentation and test scripts (9 recommendations)
- 4) Additional Testing - Conduct additional testing in selected areas (7 recommendations)

Department Response

- 1) Contingency planning - Conduct and/or improve contingency planning. The Department intends to take action on 7 recommendations and no action on another 3 recommendations.
- 2) Configuration management - Implement software configuration management and remove obsolete code. The Department plans to take action on 1 recommendation and no action on another 5 recommendations.
- 3) Test planning - Create/Recreate testing documentation. The Department plans to take action on 6 recommendations and no action on another 3 recommendations.
- 4) Additional testing - Conduct additional Year 2000 testing. The Department plans to take action on 1 recommendation and no action on another 6 recommendations.

Plans

- 1) Contingency Planning: The Department reports completing all intended actions to address contingency planning recommendations.

- 2) Configuration Management: The Department plans no work on configuration management recommendations.
- 3) Test planning - Create/Recreate testing documentation The Department reports completing all intended actions to address these recommendations.
- 4) Additional testing - Conduct additional Year 2000 testing. The Department reports completing all intended actions on the Lottery system and plans no action on these testing recommendations in other system areas.

As of report publication, the Department reported completion of these plans.

**2.2.20 Secretary of State
Risk Analysis (Concerns)**

None.

Code Review

Secretary of State	
Code IV&V Status	
Lines of Code (LOC) to be Validated	485,857
LOC Validated	485,857
Potential Errors - Count	32
Potential Errors - Errors Per Million LOC	66
Actual Errors - Count	0
Actual Errors - Errors Per Million LOC	0

Findings

The scope of the code review included 3 fatal and critical impact systems: UCC, Corporations and Accounting. The code review effort began in early September 1999. The vendor has completed analysis on 485,857 lines of fatal and critical impact code.

Department Response

The Department has interpreted the vendor results on 485,857 lines they have received. They have found, and reported to the Project Office, 0 actual Year 2000 errors from 32 potential error situations identified in the vendor results.

The findings to date indicate an actual error rate of 0 Year 2000 errors per million lines of fatal and critical impact production code.

Plans

Not applicable - no errors found.

Process Review

Department of Secretary of State					
Process IV&V Status					
Area Reviewed	Total Recommendations	Year 2000 Specific Recommendations	Status of Y2K Recommendations		
			No Action Intended	Action Intended	Action Complete
Department	9	7	3	3	1
ACCOUNTING	13	6	4	1	1
CORPORATIONS	12	5	3	1	1
UNIFORM CODE	12	5	3	1	1
TOTALS	46	23	13	6	4

Findings and Recommendations

Twenty-three Year 2000 related findings and recommendations were received in three subject areas.

- 1) Testing - There were 11 recommendations concerning the handling of test criteria and future testing.
- 2) Contingency Planning - There are 6 recommendations regarding contingency planning.
- 3) Removal of obsolete code - There were 3 recommendations to remove obsolete or inactive code from source libraries.
- 4) Miscellaneous - There were 3 unrelated recommendations. 1 concerned the documentation of inventory for Year 2000 purposes. The other 2 were not related to Year 2000 issues.

Department Response

The Department reports it will take action on 10 of 23 recommendations.

- 1) Testing - The Department considers that the existing Year 2000 test results were cost effective and will not conduct further testing.
- 2) Contingency Planning - There are 6 recommendations regarding contingency planning. The Department intends to take action on all 6.
- 3) Removal of obsolete code - The Department plans to remove all obsolete code in response to 3 recommendations.
- 4) Miscellaneous - The Department plans to finalize the management approval of 1 item concerned the documentation of inventory for Year 2000 purposes.

Plans

The Department reports all intended actions will be complete prior to December 31 1999. As of publication time significant progress has been made.

- 1) Testing - The Department plans no action on these recommendations. The Department considers that existing test results are cost effective.

- 2) Contingency Planning - There are 6 recommendations regarding contingency planning. At press time all intended actions remain estimated to complete by December 31, 1999 with intermediate results on schedule for December 16, 1999.
- 3) Removal of obsolete code - All intended actions are complete.
- 4) Miscellaneous - All intended actions are complete.

2.2.21 Transportation

Risk Analysis (Concerns)

The Department had a Y2K code actual error rate of 1,449 errors per million lines of code. This is a very high error rate, however, upon further investigation, it was determined that nearly 90% of these errors were related to two-digit years being used in reports. Even though it wasn't necessary, the Department decided to update the report layouts to display four-digit years.

Code Review

Department of Transportation	
Code IV&V Status	
Lines of Code (LOC) to be Validated	147,692
LOC Validated	147,692
Potential Errors - Count	275
Potential Errors - Errors Per Million LOC	1,862
Actual Errors - Count	214
Actual Errors - Errors Per Million LOC	1,449

Findings

The vendor findings indicated 275 potential code errors. This represents a very high potential error rate (1,862) per million lines of code.

Department Response

Upon review by the Department, it was determined that 214 of the 275 potential errors needed to be fixed. This remains a very high error rate (1,449) per million lines of code. These actual errors were all found in the ProMIS system. Upon further review by the Department, it was determined that the majority of these errors were a result of two-digit years being used in reports. These weren't true errors, but the Department decided to modify the reports to show four-digit years.

Plans

All code errors have been corrected and moved to production.

Process Review

Department of Transportation					
Process IV&V Status					
Area Reviewed	Total Recommendations	Year 2000 Specific Recommendations	Status of Y2K Recommendations		
			No Action Intended	Action Intended	Action Complete
Department	24	8	4	2	2
CPPS	16	2	1		1
MMS	37	10	7		3
PROMIS	21	8	7	1	
TOTALS	98	28	19	3	6

Findings and Recommendations

The Year 2000 related findings documented during the process review are categorized into five areas. They are:

- 1) Configuration control - There was no evidence of a documented configuration control procedure to control changes.
- 2) Test documentation - Documentation of testing results was not in evidence for MMS and was at a high level for ProMIS. It was recommended that testing documentation be generated.
- 3) COTS software tracking - Vendor certification letters should be tracked at the Department level.
- 4) Business continuity planning - The business continuity plan should be completed for the Data Warehouse and established for the other core business processes within the Department.
- 5) Personal computer tracking - Inventory tracking should be used to track the remediation efforts for the desktop systems.

Department Response

- 1) Configuration control - Agreed.
- 2) Test documentation - Testing of MMS was performed, but documentation was not saved. ProMIS has screen prints as testing evidence.
- 3) COTS software tracking - Vendor certification letters are maintained in each operating unit. There is no overall Department collection.
- 4) Business continuity planning - An information systems continuity plan exists, but not a business continuity plan.
- 5) Personal computer tracking - An inventory exists, but it is updated annually and not used for tracking ongoing changes.

Plans

- 1) Configuration control - The Department is documenting a process for controlling software changes. CPPS is already utilizing the draft procedures and MMS and PROMIS will use the procedures upon publication.
- 2) Test documentation - Unknown
- 3) COTS software tracking - Continue tracking at the operating unit level.
- 4) Business continuity planning - Unknown
- 5) Personal computer tracking - An active project, scheduled to complete in December, is focusing on the Year 2000 status of the PC inventory.

2.2.22 Treasury

Risk Analysis (Concerns)

The fatal/critical code used by the Treasury Department is vendor owned; therefore the Project Office could not perform IV&V. However, the vendors have cooperated with Treasury by providing statements of compliance and by sharing test results from their Year 2000 project efforts. On September 2 1999, representatives from Norwest and Wells Fargo banks made presentations to the Departments of Treasury and Personnel (GSS) and to the Project Office. The presentations addressed all the automated services used by Treasury. Binders containing test results for these bank systems were furnished to Treasury. Based upon the bank's level of Year 2000 due-diligence, the Project Office feels the level of risk for Treasury, related to these bank systems, is very low.

Code Review

Findings

Not applicable.

Department Response

Not applicable.

Plans

Not applicable.

Process Review

Findings and Recommendations

Not applicable.

Department Response

Not applicable.

Plans

Not applicable.

