United Kingdom Onshore Pipeline Operators' Association

UKOPA Process Safety

Process Safety Self Assessment Survey
2010 Survey Report

UKOPA **P**rocess **S**afety **W**orking **G**roup

Reference: PSWG/11/001 Draft v0.2
Date: February 2011

1 Summary

The methodology for the assessment of pipeline process safety developed by the UKOPA Process Safety Working Group (PSWG) is described in UKOPA/09/047. A questionnaire based on this methodology is used by UKOPA to benchmark the implementation of process safety principles by UKOPA member companies. A self assessment survey was carried out in 2010. Eight UKOPA members submitted responses, one member submitted two surveys. The survey was interrupted by a failure of the UKOPA website, however sufficient data was available to enable a comparison with trends with the 2009 results. This analysis shows that six out of the ten risk control areas have improved, two remain consistent and two show a slight reduction. This report presents the analysis of the 2010 survey results and comparison with the 2009 results reported in UKOPA/09/047, and identifies the areas for further consideration at the 2011 Process Safety Sharing Workshop.

2 Background

"Process Safety" is a collective name for the measures, systems, procedures or policies which prevent incidents and/or protect people/ environment from effects of Major Accidents.

Major Accidents are those which cause
- Multiple Fatalities
- Significant effect on the Environment
- Major media coverage

Following analysis of the Texas City and Buncefield incidents, a number of recommendations and initiatives relating to process safety have been made by regulators and major hazard industries, covering process safety requirements for:-

- Leadership
- Integrated And Comprehensive Management System
- Knowledge And Expertise
- Culture
- Clearly Defined Expectations And Accountabilities
- Support For Line Management
- Leading And Lagging performance Indicators
- Auditing and monitoring

The majority of published work relates to single, secure sites rather than distributed assets. On behalf of UKOPA, the Process Safety Working Group has identified the process safety requirements essential for safe pipeline management and operation, and identified the risk controls to be applied. The key principles are described in UKOPA/09/047.

3 Process Safety Questionnaire

The UKOPA Process Safety questionnaire is a series of scored questions which enables pipeline operators to carry out a self assessment, scoring process safety performance against the detailed topics associated with each risk control. The use of scoring allows operators to evaluate and establish datum levels for particular pipelines or networks, and analyse and compare various approaches on these assets. The purpose is to facilitate self assessment, and to allow focussed discussions between operators on specific areas of mutual interest. In this respect, it is noted that a small proportion of the detailed questions relating to the Operational Procedures (1 out of 11 question topics) and Emergency Response (2 out of 14 question topics) are relevant to liquid pipeline operations only (these are annotated in the results table in Appendix 1). The operational procedures questions relate to leak detection, and the emergency response questions relate to oil spill response.

The self assessment questionnaire is web-based for ease of completion by UKOPA members, and collation and assessment of results.

4 Assessment of 2009 Survey Results

A datum self assessment study was carried out by UKOPA using the self assessment questionnaire in 2009, and the results are reported in UKOPA/09/047. The risk controls with the largest range between maximum and minimum scores were identified for consideration at the 2009 Process Safety Sharing Workshop, these were:-

- Route Management
- Competence and Training
- Leadership
- Modification and Repair Process

5 UKOPA Process Safety Self Assessment – Analysis of 2010 Results

The self assessment exercise was repeated in 2010, and the results compared with the 2009 datum results to identify changes.

Eight UKOPA members submitted responses, one member submitted more than one response. The process was interrupted by a failure of the UKOPA website, however sufficient data was available to allow a comparison of trends to be carried out.

The overall comparison of 2009 and 2010 results is given in Table 1, and the detailed comparison of the results for each risk control is given in tabular form in Appendix 1 and shown in Figures in Appendix 2. The results show that out of the ten risk controls, the scores for six have improved, Competence and Training and Leadership are unchanged, and Asset Records and Operational Procedures have reduced slightly.

6 Discussion

The UKOPA process safety survey is used to identify the risk controls where value will be obtained from sharing of member practices. The analysis of the 2009 datum results identified the risk controls Route Management, Modification and Repair Procedures, Competency and Training and Leadership for discussion at the 2009 Process Safety sharing workshop. Assessment of the 2010 survey results show that Route Management and Modification and Repair Procedures have improved, and Competency and Training and Leadership are unchanged.

The 2010 survey results show that the risk controls Asset Records and Operational Procedures did not score highly, so these areas have been selected for consideration at the 2011 UKOPA Process Safety sharing workshop facilitated by the PSWG. The risk control area Integrity will also be considered at the workshop, as it is of interest to UKOPA members.

7 Conclusion.

The results of the 2010 UKOPA pipeline process safety self assessment survey show improvement in six out of 10 of the risk controls, including two of the areas discussed at the 2009 sharing workshop. This provides measurement of the improvement in the implementation of process safety principles in the UK pipeline industry, and confirms the value of member discussions at the Process Safety sharing workshop.

8 Recommendations

Based on the assessment of 2010 UKOPA process safety survey results, the PSWG recommends that:-

i) A UKOPA Process Safety Sharing Workshop is held to discuss, consider and make specific recommendations on the following risk control areas:-

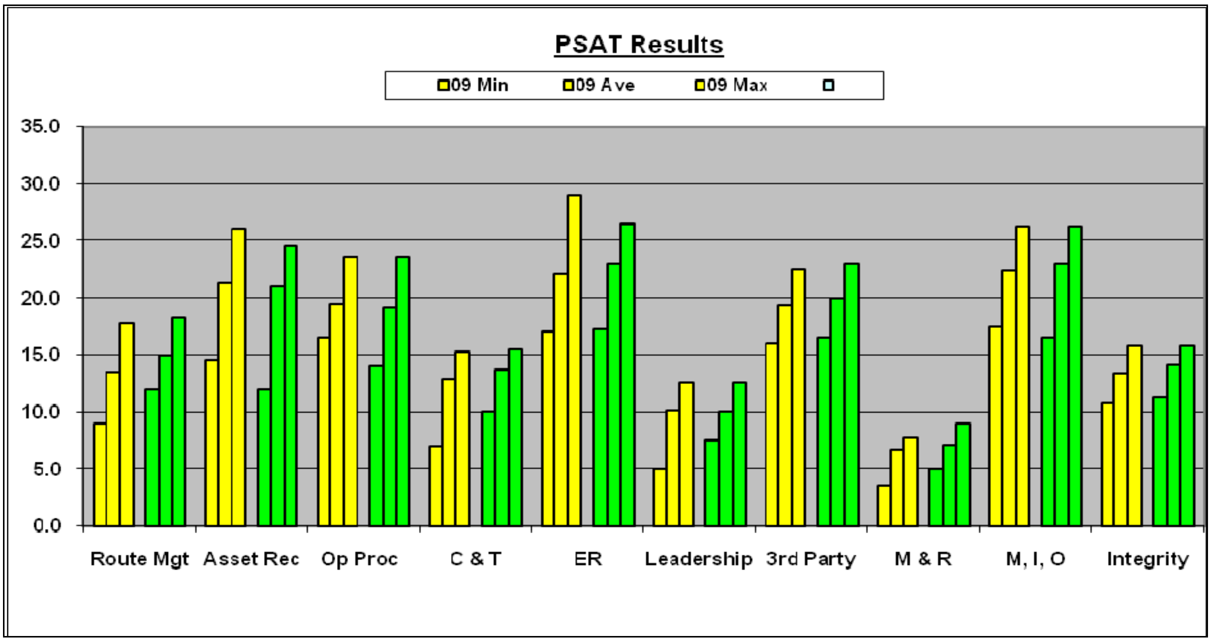
   a. Asset Records
   b. Operating procedures
   c. Integrity

ii) The Process Safety self assessment survey is repeated in 2012 to continue to monitor pipeline process safety issues.

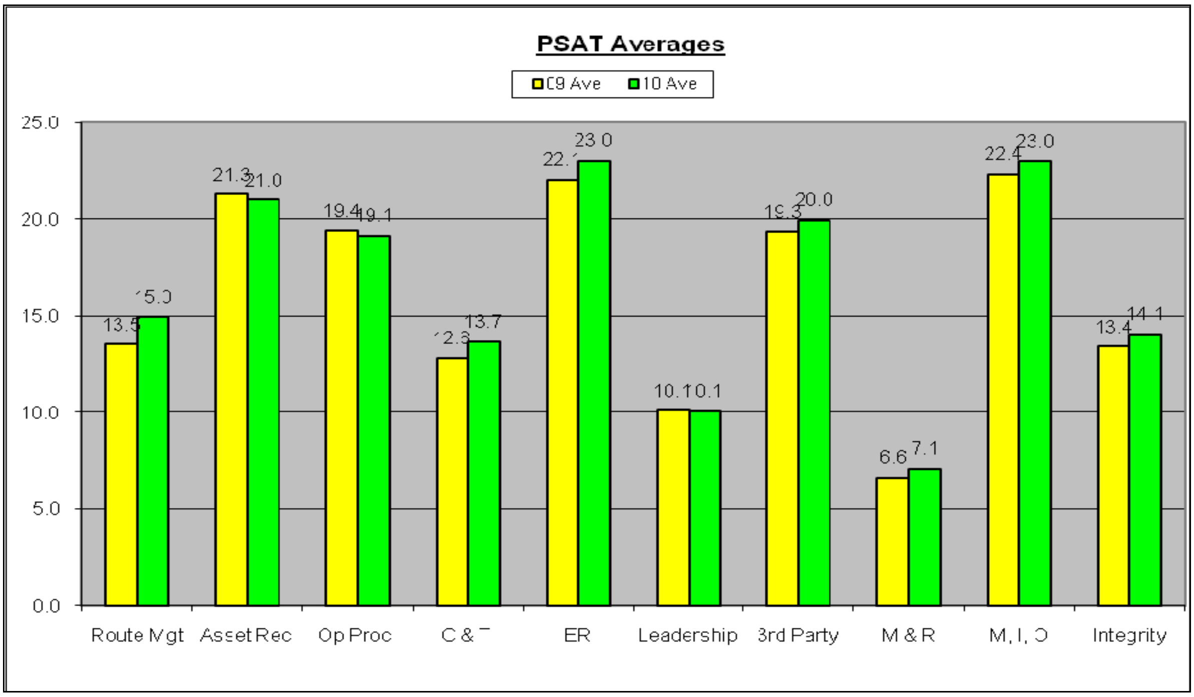
Table 1 Comparison of 2009 and 2010 Process Safety Benchmark Results

Risk Control	2009 Results			2010 Results			Differences		
	Min	Ave	Max	Min	Ave	Max	Min	Ave	Max
Route Management	9.0	13.5	17.8	12.0	15.0	18.3	3.0	1.4	0.5
Asset Records	14.6	21.3	26.0	12.0	21.0	24.6	-2.6	-0.3	-1.5
Operational Procedures	16.5	19.4	23.5	14.0	19.1	23.5	-2.5	-0.3	0.0
Competence & Training	10.0	13.7	15.5	10.0	13.7	15.5	0.0	0.0	0.0
Emergency Response	17.0	22.1	29.0	17.3	23.0	26.5	0.3	1.0	-2.5
Leadership	5.0	10.1	12.5	7.5	10.1	12.5	2.5	0.0	0.0
3rd Party Interference	16.0	19.3	22.5	16.5	20.0	23.0	0.5	0.6	0.5
Modifications & Repairs Process	3.5	6.6	7.8	5.0	7.1	9.0	1.5	0.4	1.3
Maintenance, Inspection & Other	17.5	22.4	26.3	16.5	23.0	26.3	-1.0	0.6	0.0
Integrity	10.8	13.4	15.8	11.3	14.1	15.8	0.5	0.7	0.0

Figure 1 – Comparison of 2009 and 2010 Process Safety Results



a) Min, Ave, Max



b) Average

Appendix 1
Tables - PSAT 2010 Results and Comparison with 2009 Results

Table A1 Comparison of 2009 and 2010 Process Safety Results for Route Management

Route management	2009 Results			2010 Results			Differences		
	Min	Ave	Max	Min	Ave	Max	Min	Ave	Max
Leak Detection	0.0	0.2	0.5	0	0.3	0.5	0.0	0.1	0.0
River & Special Crossings	1.8	2.2	2.5	1.75	2.3	2.5	0.0	0.1	0.0
Ground Condition	1.8	2.4	3.0	1	2.4	3.0	-0.8	0.1	0.0
Soil erosion, washout, marshland	0.0	1.4	2.5	0	2.1	2.5	0.0	0.7	0.0
Mineral extraction and mining	0.0	1.2	2.0	0.5	1.3	2.0	0.5	0.1	0.0
Change of land use	0.5	1.5	2.0	1	1.6	2.0	0.5	0.1	0.0
Ground movement checks	0.0	1.3	1.5	0	1.3	1.5	0.0	0.1	0.0
Routing Survey	0.3	1.5	2.0	1.25	1.7	2.0	1.0	0.1	0.0
Line Walk	0.0	1.9	2.5	0	2.0	2.5	0.0	0.1	0.0

Route management	2009 Results			2010 Results			Differences		
	Min	Ave	Max	Min	Ave	Max	Min	Ave	Max
Total	4.3	13.5	18.5	5.5	15.0	18.5	1.3	1.5	0.0

Table A2 Comparison of 2009 and 2010 Process Safety Results for Asset Records

Asset Records	2009 Results			2010 Results			Differences		
	Min	Ave	Max	Min	Ave	Max	Min	Ave	Max
GIS	0.0	1.5	2.5	0.0	1.6	2.5	0.0	0.0	0.0
Pipeline Records - GIS	1.5	2.1	3.0	1.5	2.2	3.0	0.0	0.1	0.0
Review & Update	0.5	1.3	1.5	1.0	1.3	1.5	0.5	0.0	0.0
Results and Data - Inspection Data	1.0	2.1	3.3	1.0	2.0	2.5	0.0	-0.2	-0.8
Operating Records (Pressure Cycles, Temperature, start / stop)	0.0	1.7	2.5	1.0	1.6	1.8	1.0	-0.1	-0.8
Asset Information	0.3	1.2	1.5	0.3	1.3	1.5	0.0	0.1	0.0
Maintenance Records	1.5	2.2	2.5	1.5	2.3	2.5	0.0	0.1	0.0

Asset Records	2009 Results			2010 Results			Differences		
	Min	Ave	Max	Min	Ave	Max	Min	Ave	Max
Availability / Accessibility of critical information	0.5	1.4	2.0	0.8	1.5	2.0	0.3	0.0	0.0
Operating Manuals	1.3	2.8	3.5	2.3	2.9	3.5	1.0	0.2	0.0
Maintenance & Operating Drawings	1.3	3.2	4.0	3.0	3.6	4.0	1.8	0.3	0.0
Design & Construction	0.7	1.8	2.5	0.7	1.8	2.5	0.0	0.0	0.0
Asset Records Total	8.5	21.3	28.8	13.0	22.0	27.3	4.5	0.7	-1.5

Table A3 Comparison of 2009 and 2010 Process Safety Results for Operating Procedures

Operating Procedures	2009 Results			2010 Results			Differences		
	Min	Ave	Max	Min	Ave	Max	Min	Ave	Max
Leak Detection system*	0.0	1.7	4.0	0.0	1.6	4.0	0.0	-0.1	0.0
Alarm Management	1.0	1.4	1.5	1.5	1.5	1.5	0.5	0.1	0.0
Isolation procedures	0.5	1.3	2.0	0.5	1.3	2.0	0.0	0.0	0.0
Interfaces with upstream and Downstream	1.5	2.4	2.5	0.0	2.2	2.5	-1.5	-0.1	0.0
Control Centres	2.0	2.9	3.0	3.0	3.0	3.0	1.0	0.1	0.0

Operating Procedures	2009 Results			2010 Results			Differences		
	Min	Ave	Max	Min	Ave	Max	Min	Ave	Max
Pressure management	2.0	2.4	2.5	2.0	2.4	2.5	0.0	0.0	0.0
Roles and Responsibilities	1.0	1.9	2.0	1.5	1.9	2.0	0.5	0.0	0.0
Manning levels	1.0	1.8	2.0	1.0	1.8	2.0	0.0	0.0	0.0
Operating Manuals	1.3	2.8	3.5	1.5	1.9	2.0	0.3	-0.8	-1.5
Permit to work	0.5	1.9	2.0	2.0	2.0	2.0	1.5	0.1	0.0
Operating Procedures Total	10.8	20.4	25.0	13.0	19.6	23.5	2.3	-0.8	-1.5

*Note – Questions annoted * relate to liquid pipeline operators*

Table A4 Comparison of 2009 and 2010 Process Safety Results for Competence and Training

Competence & Training	2009 Results			2010 Results			Differences		
	Min	Ave	Max	Min	Ave	Max	Min	Ave	Max
Individual competence Assessment	1.5	2.9	3.5	3.0	3.1	3.5	1.5	0.2	0.0
Human factors	1.0	1.8	2.5	1.0	1.8	2.5	0.0	0.0	0.0
Resource Assessment	0.0	1.3	1.5	1.0	1.4	1.5	1.0	0.2	0.0
Training plans	0.5	2.1	2.5	2.0	2.4	2.5	1.5	0.3	0.0
Contractor management and	2.5	4.8	5.8	2.5	5.3	6.0	0.0	0.5	0.3

Competence & Training	2009 Results			2010 Results			Differences		
	Min	Ave	Max	Min	Ave	Max	Min	Ave	Max
Competence									
Competence and Training Total	5.5	12.9	15.8	9.5	14.0	16.0	4.0	1.2	0.3

Table A5 Comparison of 2009 and 2010 Process Safety Results for Emergency Response

Emergency Response	2009 Results			2010 Results			Differences		
	Min	Ave	Max	Min	Ave	Max	Min	Ave	Max
Stakeholder liason	0.5	1.8	2.0	1.5	1.9	2.0	1.0	0.1	0.0
P.E.R.O & Training	0.0	1.4	2.0	0.5	1.7	2.0	0.5	0.3	0.0
Emergency response facilities	1.0	1.9	2.0	2.0	2.0	2.0	1.0	0.1	0.0
Incident response management	1.5	2.2	2.5	2.0	2.2	2.5	0.5	0.1	0.0
Emergency equipment & spares	0.5	1.7	2.0	1.0	1.7	2.0	0.5	0.0	0.0
Oil spill containment procedures & testing*	0.0	0.4	2.0	0.0	0.8	1.5	0.0	0.3	-0.5
Emergency Plan	1.8	2.7	3.5	1.8	2.8	3.5	0.0	0.1	0.0
Incident response equipment	1.0	1.7	2.0	1.5	1.7	2.0	0.5	0.0	0.0

Emergency Response	2009 Results			2010 Results			Differences		
	Min	Ave	Max	Min	Ave	Max	Min	Ave	Max
Oil spill containment equipment & testing*	0.0	0.9	3.0	0.0	1.3	3.0	0.0	0.4	0.0
Resource	1.0	1.7	2.0	1.5	1.7	2.0	0.5	0.0	0.0
Communications	1.0	1.6	2.5	1.0	1.4	2.5	0.0	-0.1	0.0
Testing Arrangements	1.5	2.3	3.0	1.5	2.5	3.0	0.0	0.2	0.0
Provision of information	1.5	1.8	2.0	1.5	1.8	2.0	0.0	0.0	0.0
Emergency Response Total	11.3	22.1	30.5	15.8	23.5	30.0	4.5	1.5	-0.5

*Note – Questions annoted * relate to liquid pipeline operators*

Table A6 Comparison of 2009 and 2010 Process Safety Results for Leadership

Leadership	2009 Results			2010 Results			Differences		
	Min	Ave	Max	Min	Ave	Max	Min	Ave	Max
Learning Lessons Arrangements	2.0	3.4	4.0	2.5	3.7	4.0	0.5	0.3	0.0
Leadership	0.5	2.3	3.0	0.5	2.1	3.0	0.0	-0.2	0.0
Performance Reporting	2.0	4.4	5.5	2.5	4.4	5.5	0.5	0.0	0.0
Leadership Totals	4.5	10.1	12.5	5.5	10.1	12.5	1.0	0.1	0.0

Table A7 Comparison of 2009 and 2010 Process Safety Results for 3rd Party Interference

3rd Party Interference	2009 Results			2010 Results			Differences		
	Min	Ave	Max	Min	Ave	Max	Min	Ave	Max
Encroachments	1.5	1.9	2.0	1.5	1.8	2.0	0.0	-0.1	0.0
Depth of Cover	0.5	1.0	1.8	0.5	1.2	1.8	0.0	0.2	0.0
Response to Enquiries	1.0	1.2	1.5	1.0	1.3	1.5	0.0	0.1	0.0
Markers	1.5	2.9	4.0	2.0	3.2	4.0	0.5	0.3	0.0
Stakeholder Management	1.5	2.3	2.5	1.5	2.4	2.5	0.0	0.1	0.0
Surveillance	0.8	1.5	2.0	1.0	1.6	2.0	0.3	0.1	0.0
Management of Major Works	2.0	2.5	2.5	2.5	2.5	2.5	0.5	0.0	0.0
Management of High Risk Locations	0.5	1.2	1.5	0.8	1.4	1.5	0.3	0.2	0.0
Infringement data	0.0	1.3	1.5	1.0	1.4	1.5	1.0	0.1	0.0
Land Owner / Occupier Liaison	1.5	2.0	2.5	1.5	1.9	2.5	0.0	0.0	0.0
Developments of Land use planning	0.5	1.6	2.0	0.5	1.6	2.0	0.0	0.0	0.0
3rd Party Interference Totals	11.3	19.3	23.8	13.8	20.3	23.8	2.5	1.0	0.0

Table A8 Comparison of 2009 and 2010 Process Safety Results for Modification and Repair Process

Modification and Repair Process	2009 Results			2010 Results			Differences		
	Min	Ave	Max	Min	Ave	Max	Min	Ave	Max
Procedure	2.0	3.5	4.0	3.0	3.6	4.0	1.0	0.1	0.0
Roles & Responsibilities	0.8	1.8	2.3	1.5	2.1	4.0	0.8	0.3	1.8
Management of Change	0.0	1.3	1.5	0.0	1.3	1.5	0.0	-0.1	0.0
Modification Repairs Process Totals	2.8	6.6	7.8	4.5	7.0	9.5	1.8	0.4	1.8

Table A9 Comparison of 2009 and 2010 Process Safety Results for Maintenance and Inspection

Maintenance, Inspection & Other	2009 Results			2010 Results			Differences		
	Min	Ave	Max	Min	Ave	Max	Min	Ave	Max
Electrical Equipment - Other	2.8	3.3	3.5	2.8	3.3	3.5	0.0	0.0	0.0
Signage	0.8	2.4	3.0	1.3	2.6	3.0	0.5	0.3	0.0
Instrumentation / Telemetry / Isolation Valve Operation	1.8	2.6	3.0	2.0	2.6	3.0	0.3	0.1	0.0
Hazardous areas assessments	0.0	1.5	2.5	1.0	2.2	2.5	1.0	0.7	0.0
Security systems	1.3	2.7	3.8	2.3	3.0	3.8	1.0	0.4	0.0

Maintenance, Inspection & Other	2009 Results			2010 Results			Differences		
	Min	Ave	Max	Min	Ave	Max	Min	Ave	Max
Pig traps, filters, pressure vessels	1.0	2.2	2.5	1.0	2.2	2.5	0.0	-0.1	0.0
Valve station checks & maintenance	1.8	3.2	3.5	1.8	3.2	3.5	0.0	-0.1	0.0
Electrical Equipment - UPS	2.0	2.6	3.0	2.5	2.8	3.0	0.5	0.2	0.0
Protective devices	1.5	1.9	2.0	1.5	1.9	2.0	0.0	0.0	0.0
Maintenance, Inspection & Other Total	12.8	22.4	26.8	16.0	23.7	26.8	3.3	1.4	0.0

Table A10 Comparison of 2009 and 2010 Process Safety Results for Integrity

Integrity	2009 Results			2010 Results			Differences		
	Min	Ave	Max	Min	Ave	Max	Min	Ave	Max
Above Ground Pipework	1.3	1.9	2.3	1.8	2.2	3.0	0.5	0.3	0.8
Damage Assessment	0.5	1.0	1.0	1.0	1.0	1.0	0.5	0.0	0.0
Integrity Management	1.0	1.9	2.0	1.5	1.9	2.0	0.5	0.1	0.0
In Line Inspection	2.0	2.8	3.0	2.0	3.0	4.3	0.0	0.2	1.3
Corrosion	1.5	3.0	3.5	2.3	3.1	3.5	0.8	0.2	0.0

Integrity	2009 Results			2010 Results			Differences		
	Min	Ave	Max	Min	Ave	Max	Min	Ave	Max
Protection									
Corrosion Management - External	1.0	1.6	2.0	1.3	1.7	2.0	0.3	0.1	0.0
Corrosion Management - Internal	0.0	1.4	2.0	0.0	1.5	2.0	0.0	0.1	0.0
Integrity Totals	7.3	13.4	15.8	9.8	14.4	17.8	2.5	1.0	2.0

Appendix 2
Figures - PSAT 2010 Results and Comparison with 2009 Results

Figure A1 Route Management 1

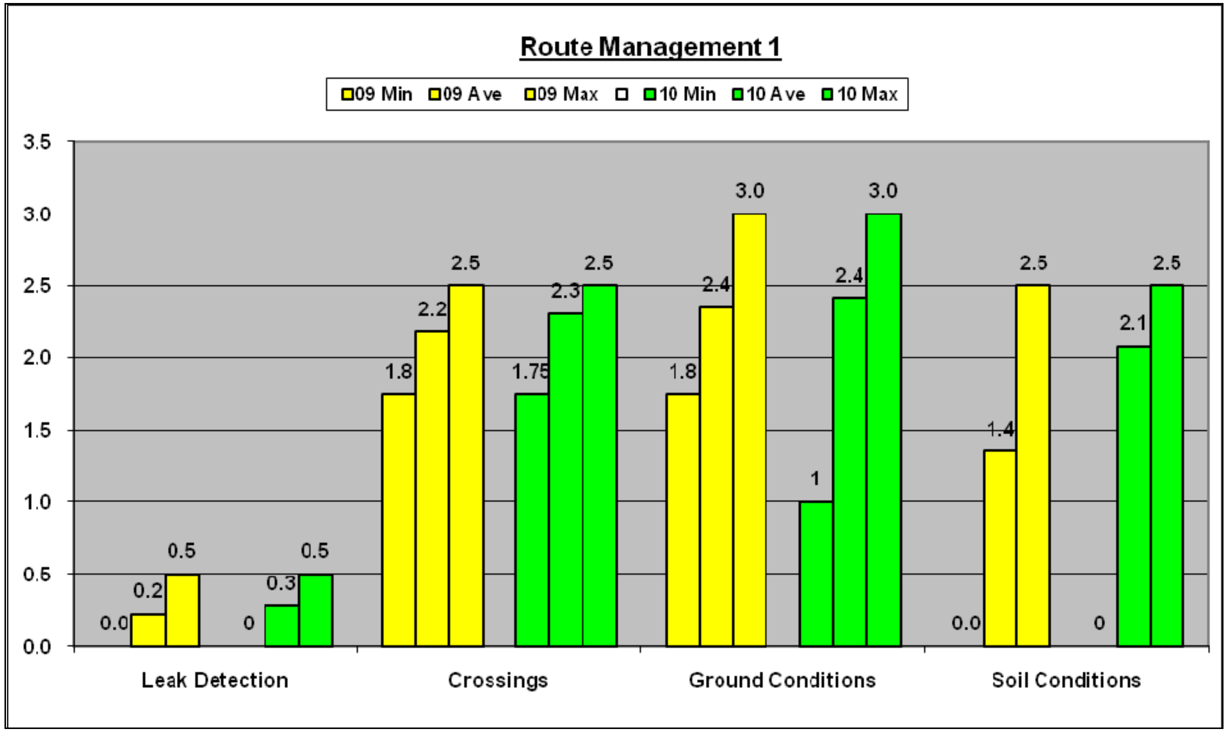


Figure A2 Route Management 2

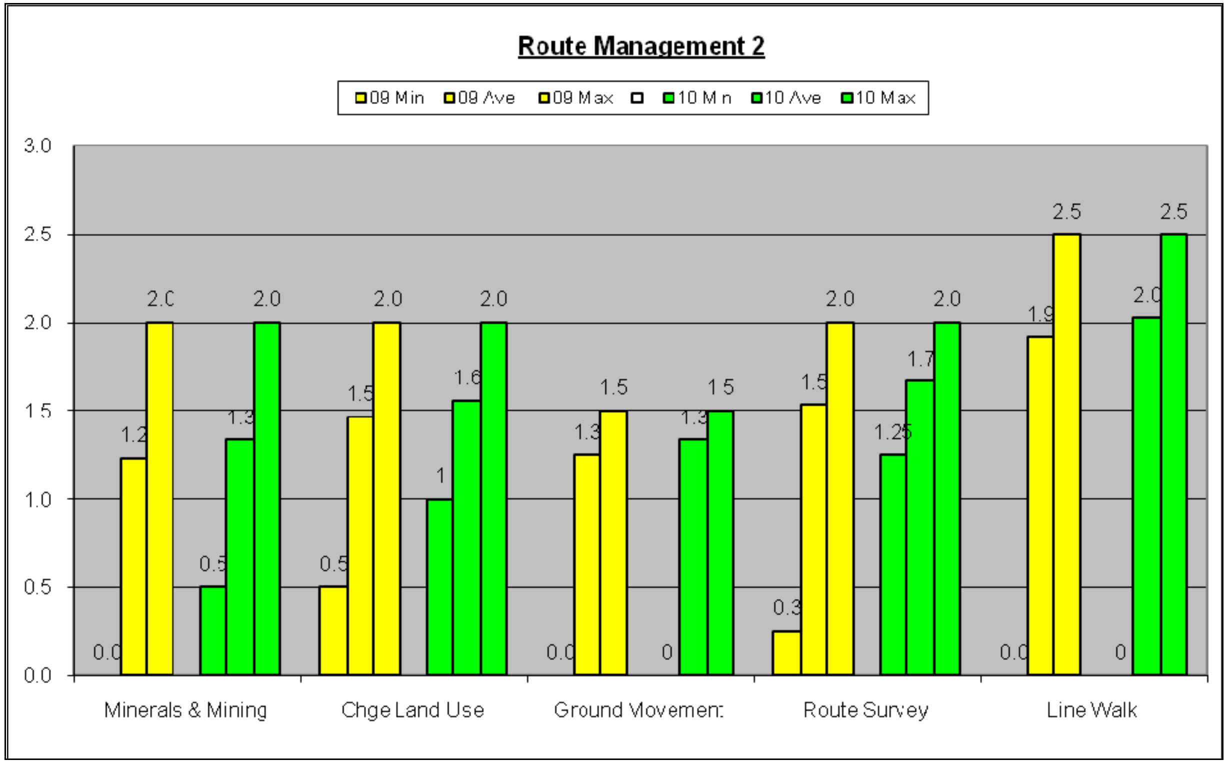


Figure A3 Asset Records 1

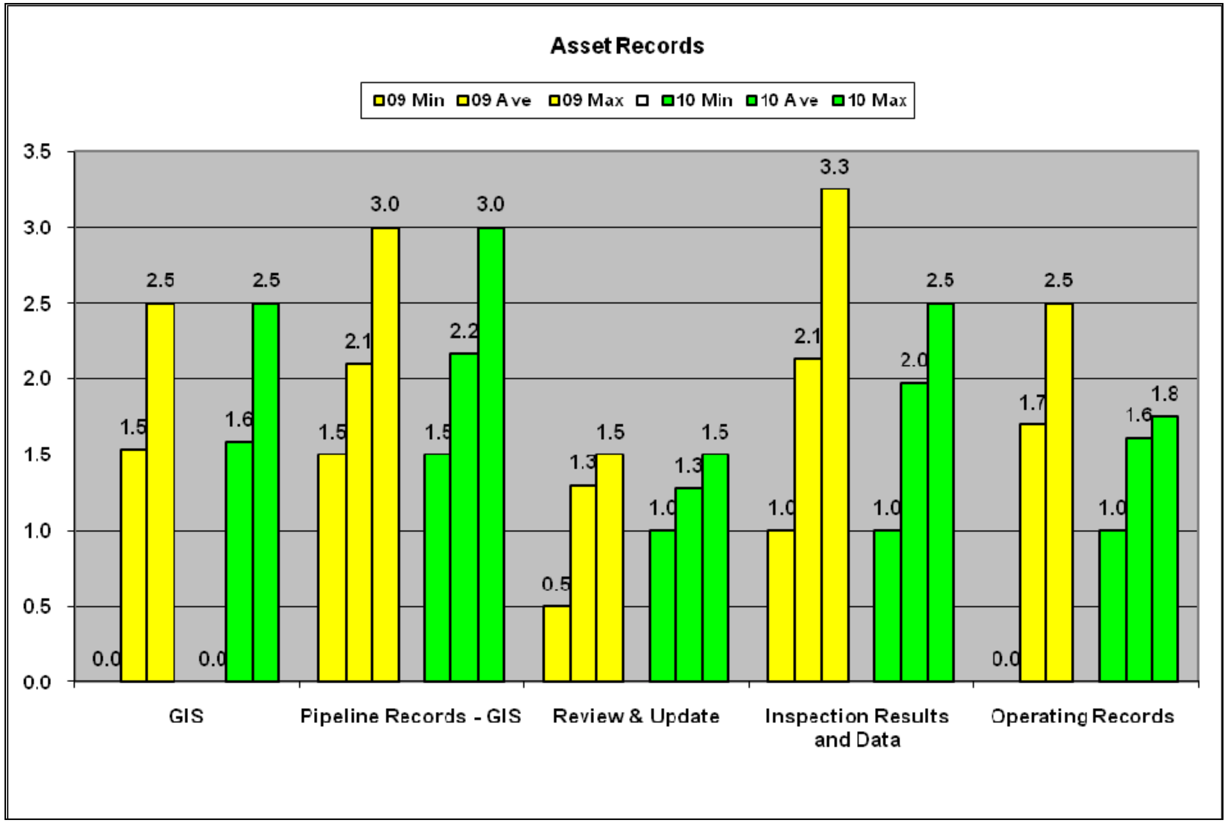


Figure A4 Asset Records 2

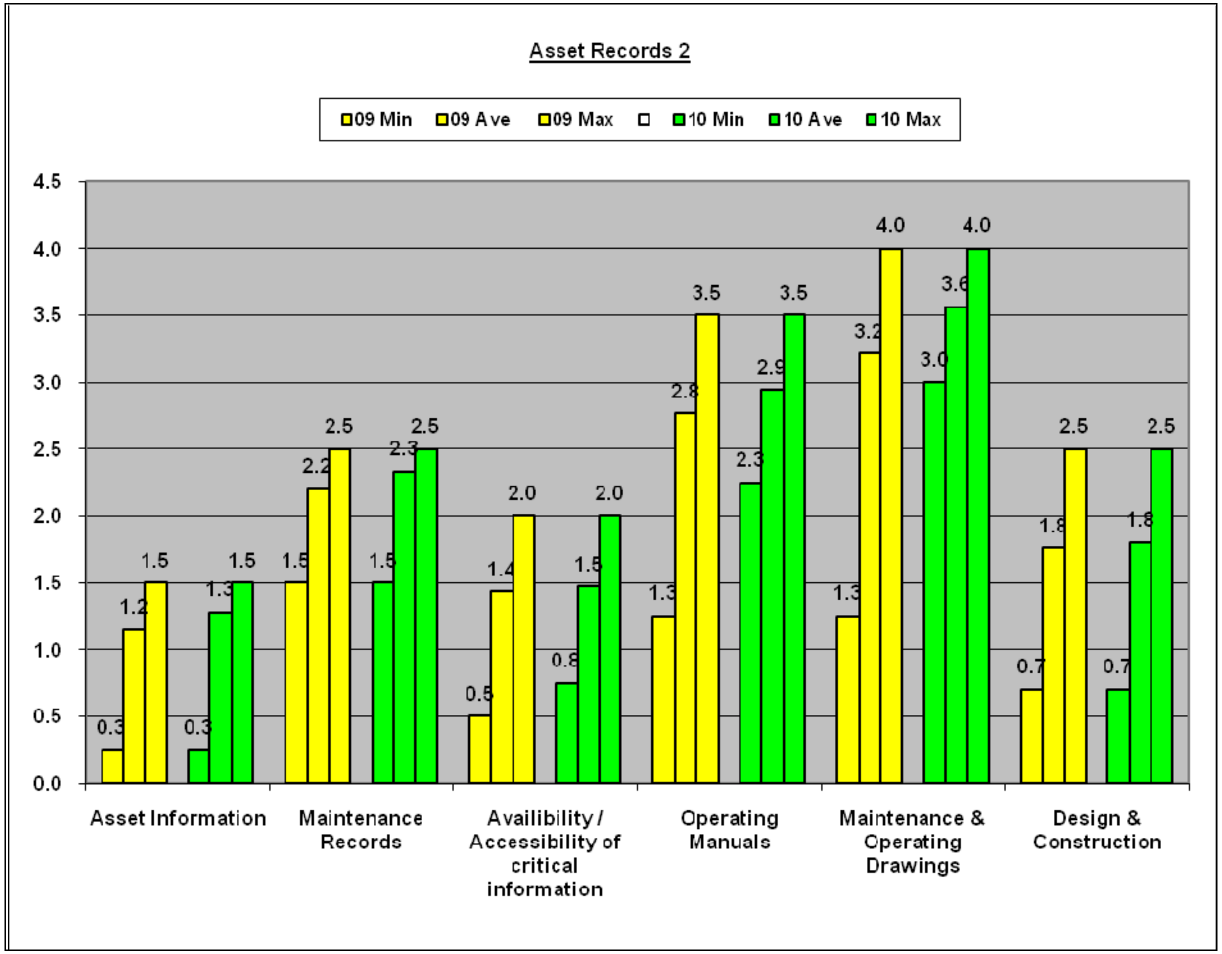


Figure A5 Operating Procedures 1

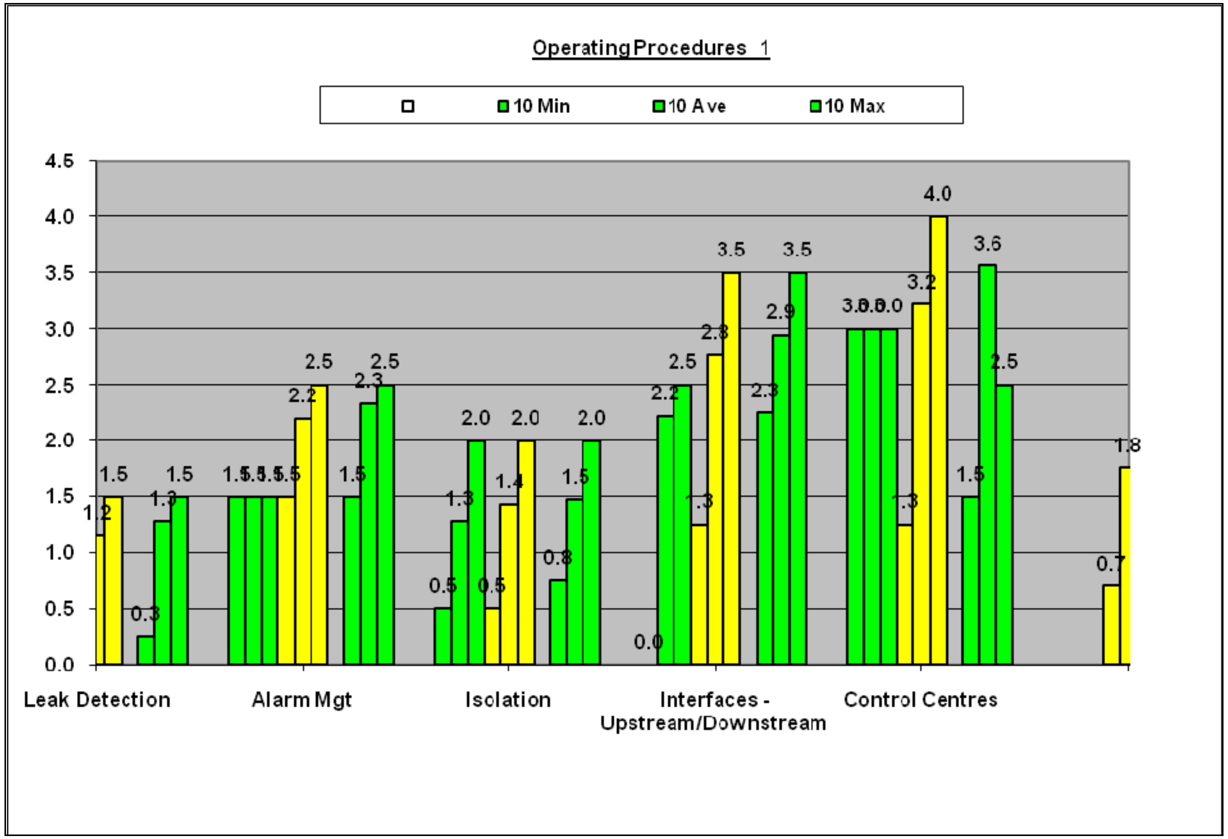


Figure A6 Operating Procedures 2

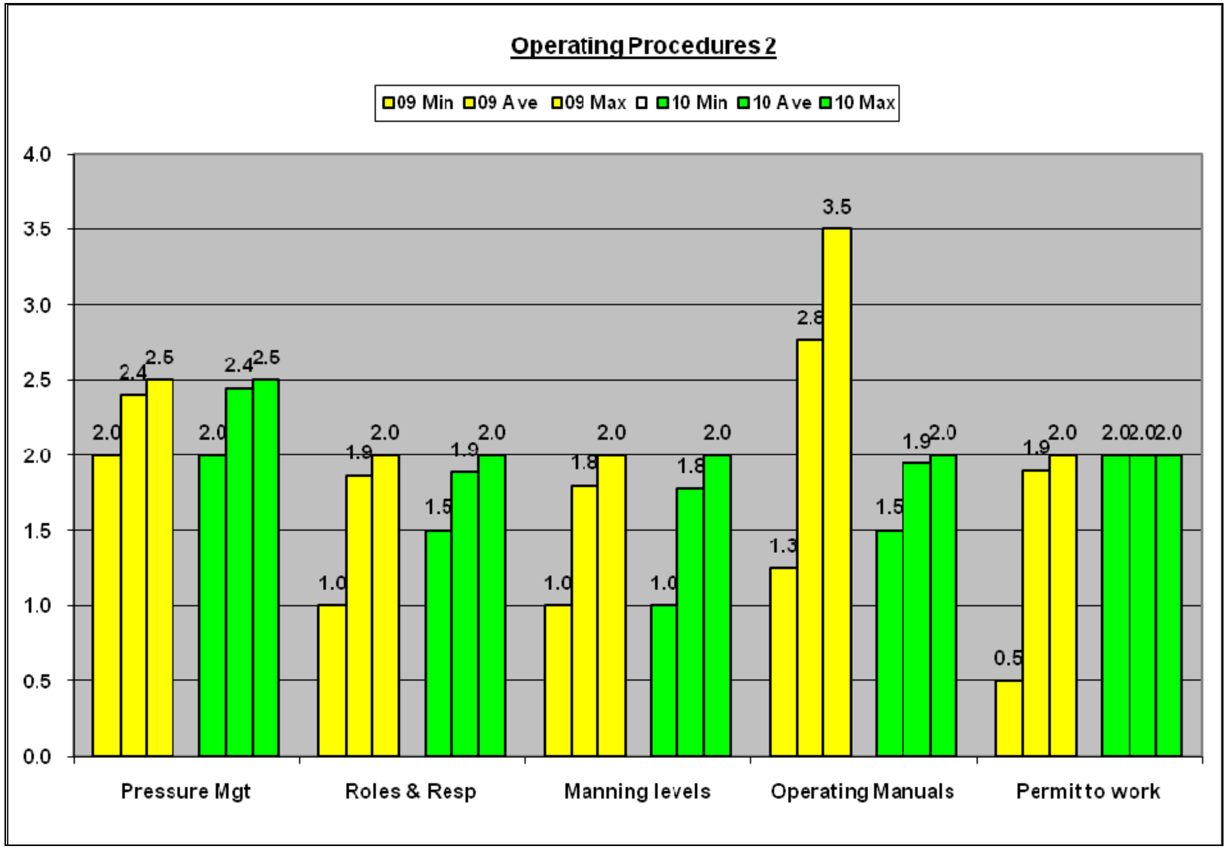


Figure A7 Competence and Training

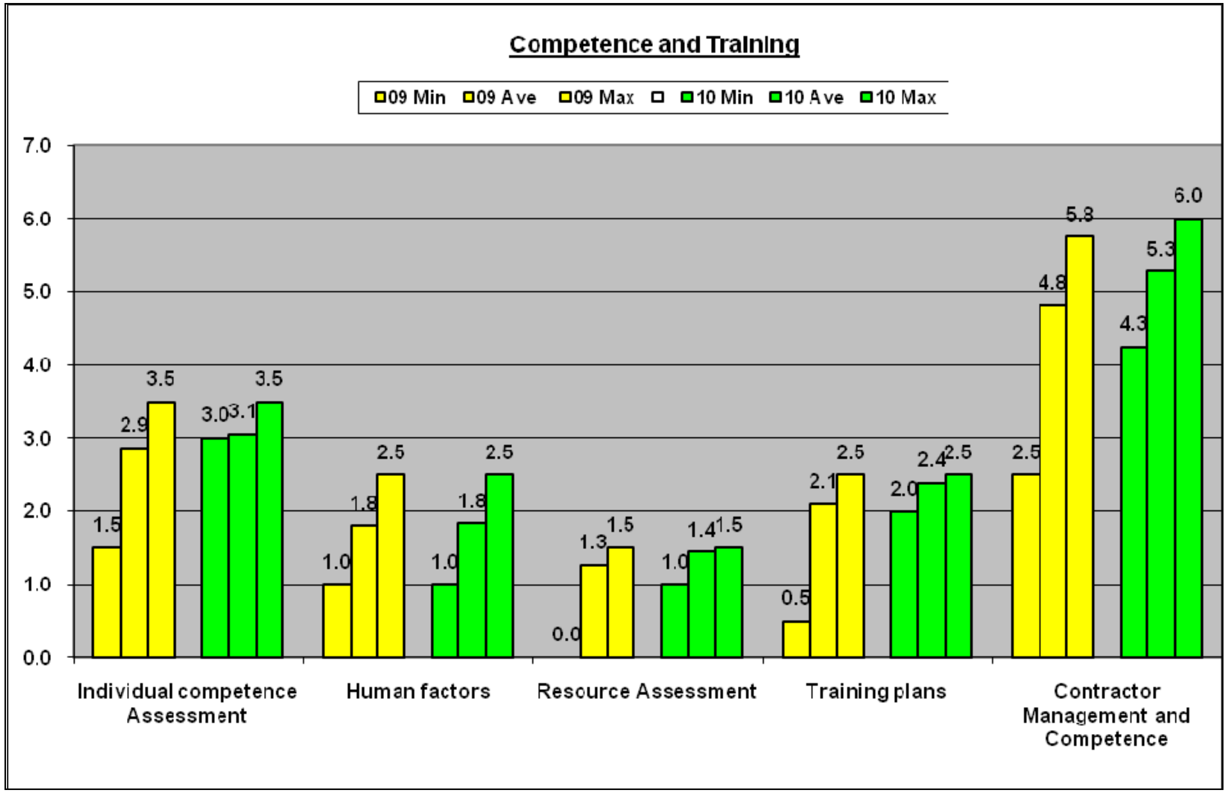


Figure A8 Emergency Response 1

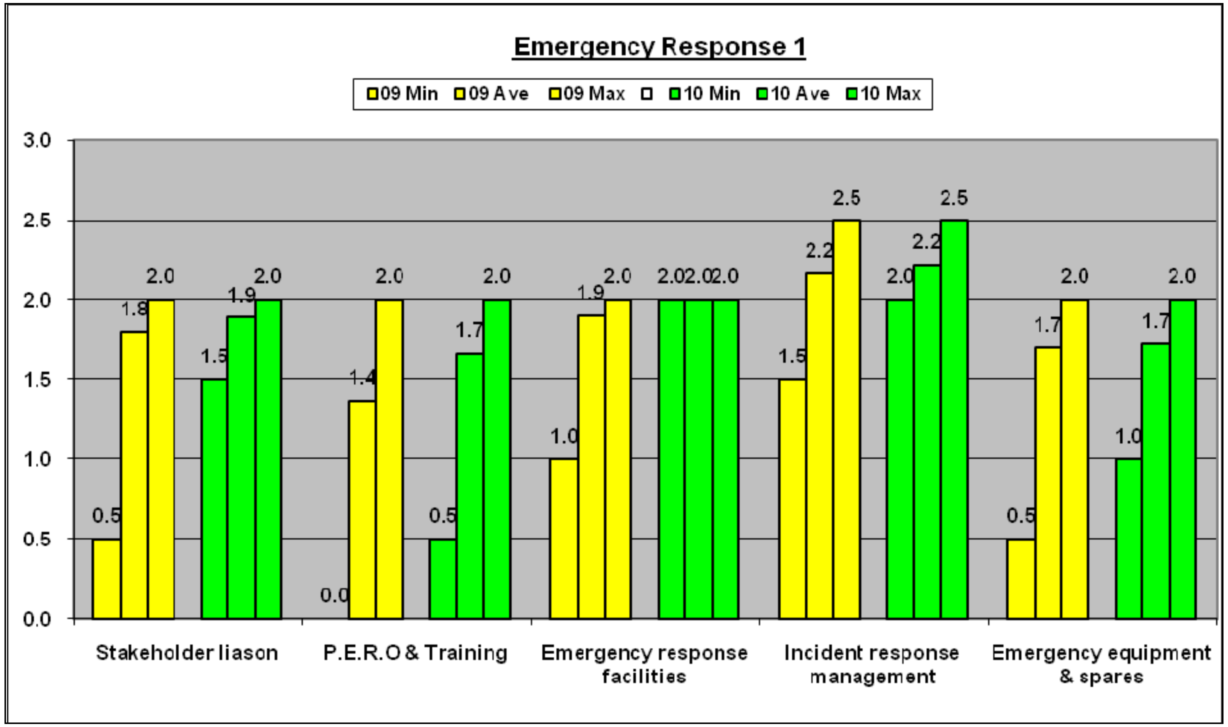


Figure A9 Emergency Response 2

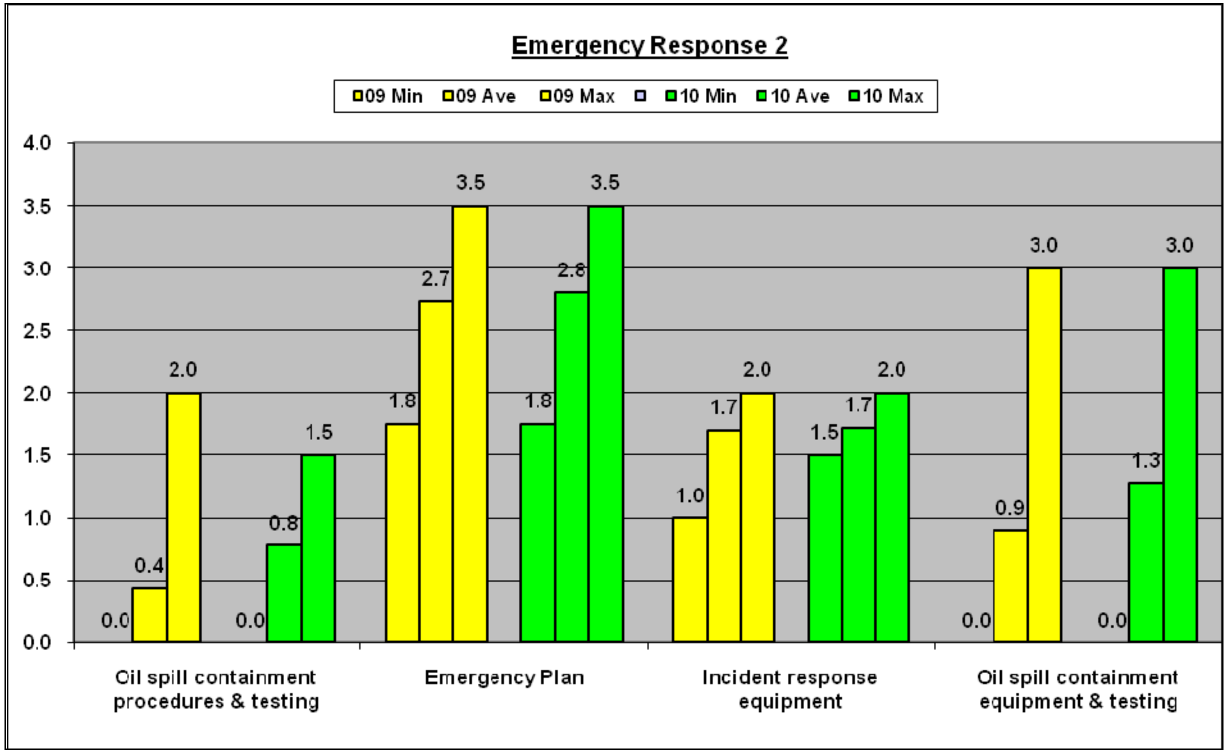


Figure A10 Emergency Response 3

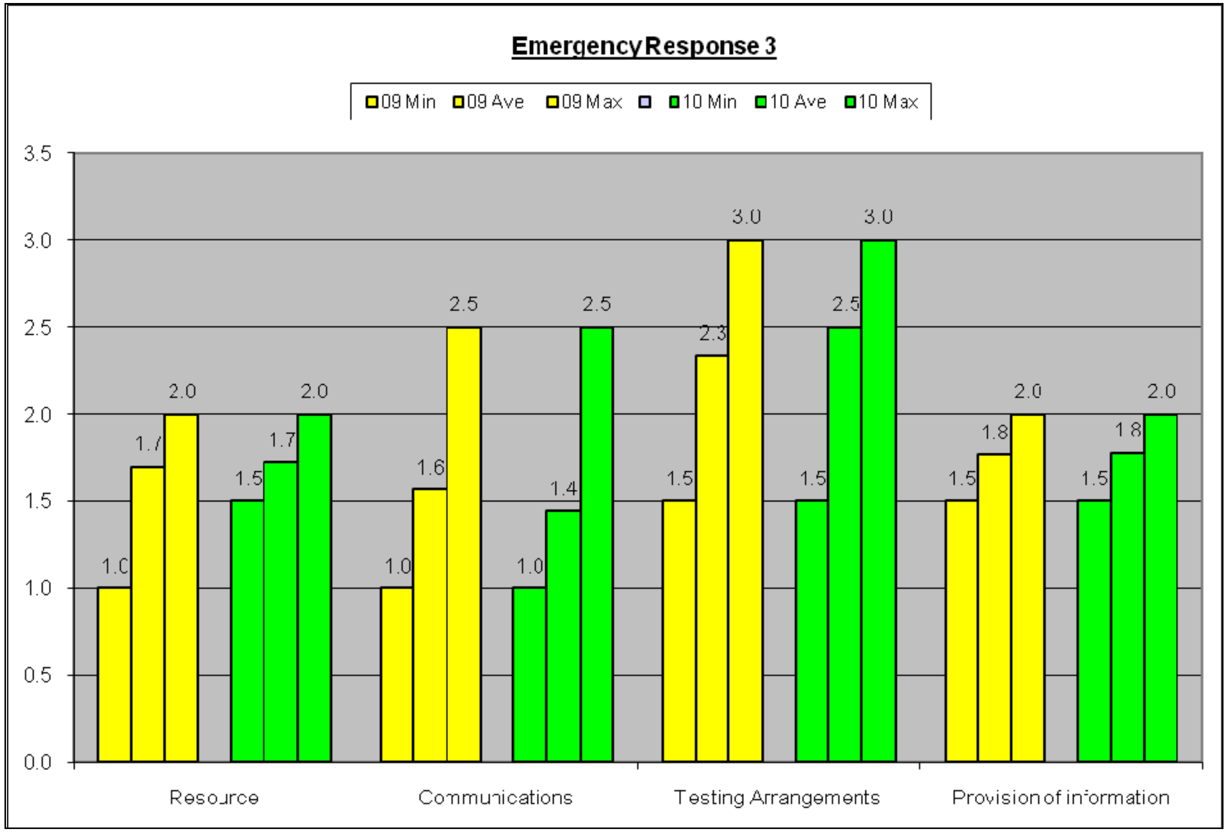


Figure A11 Leadership

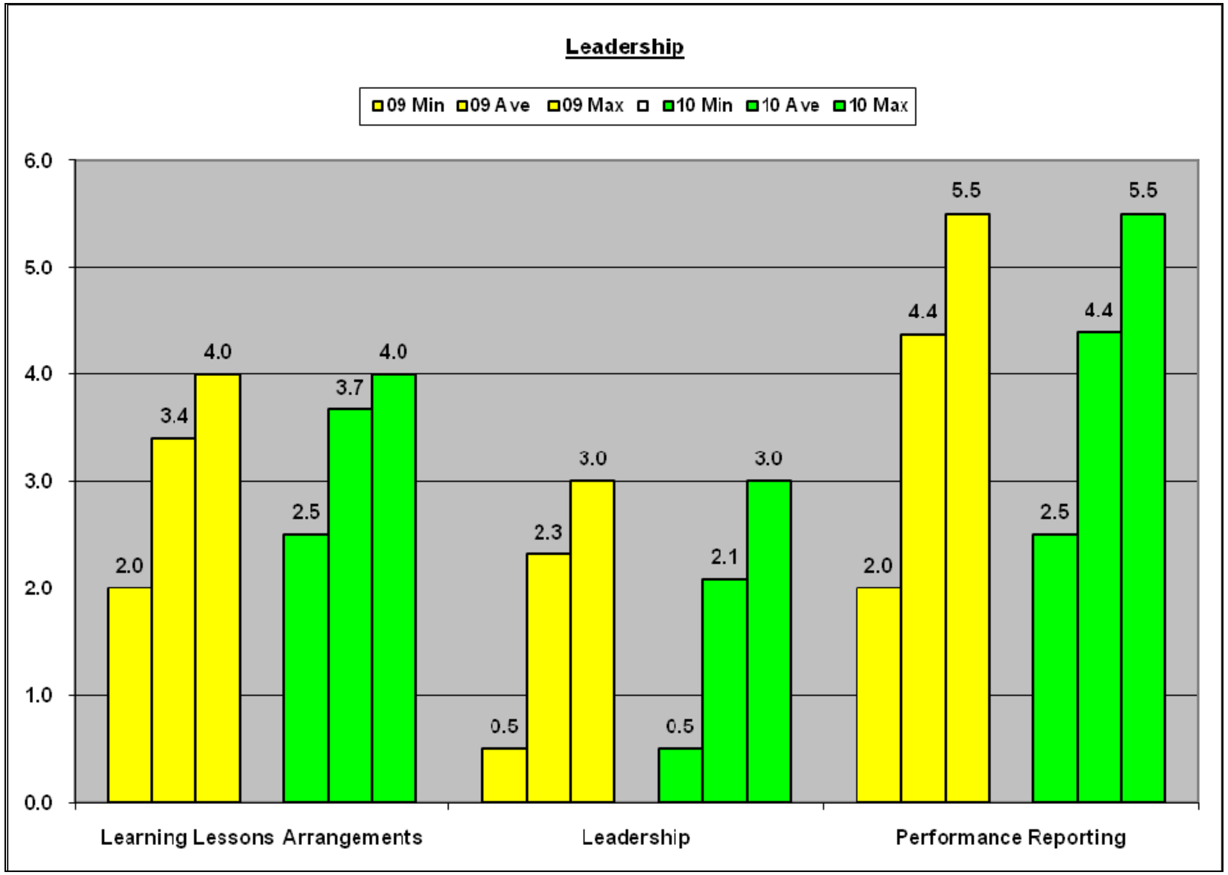


Figure A12 3rd Party Interference 1

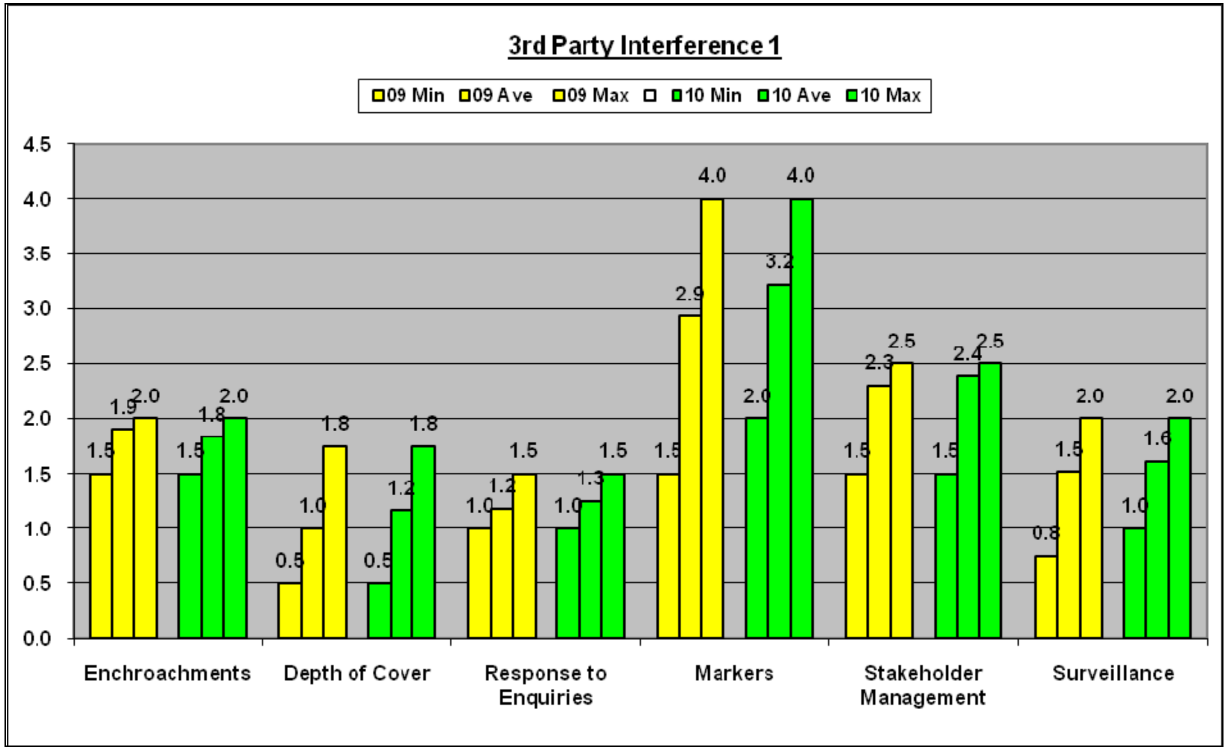


Figure A13 3rd Party Interference 2

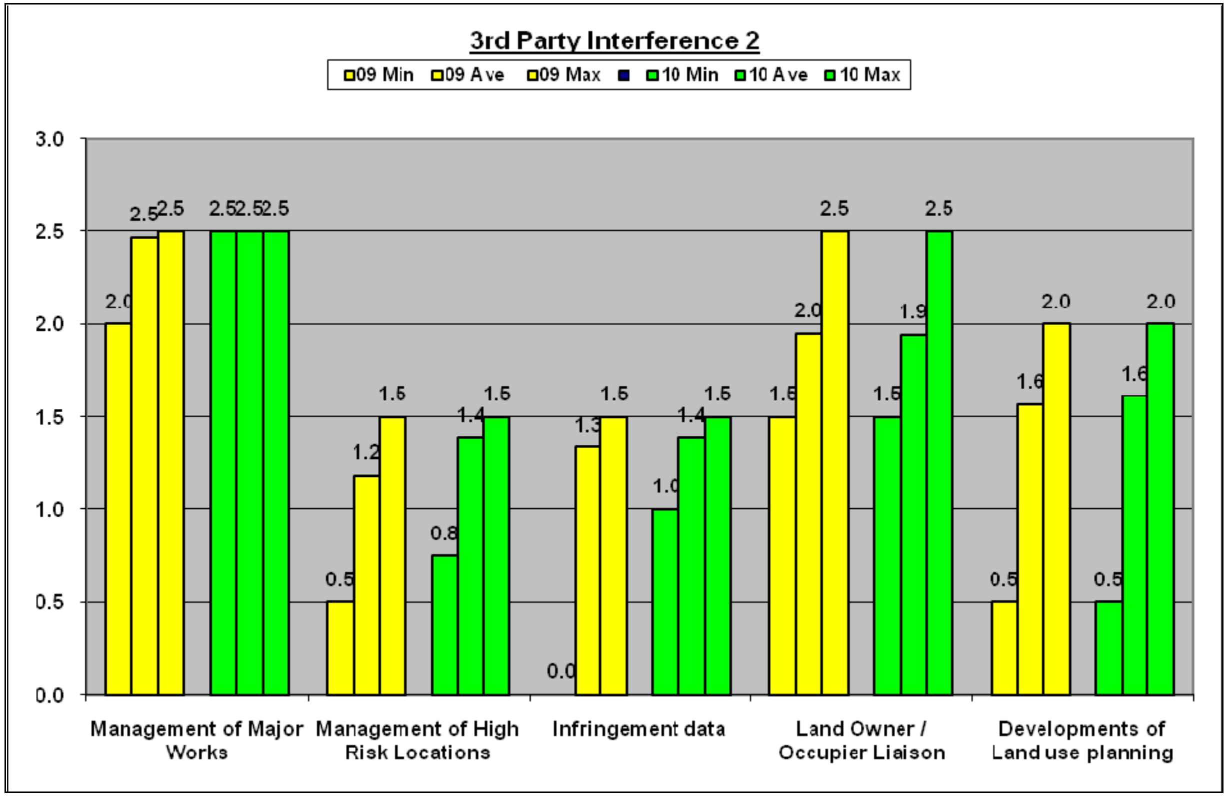


Figure A14 Modifications and Repairs Process

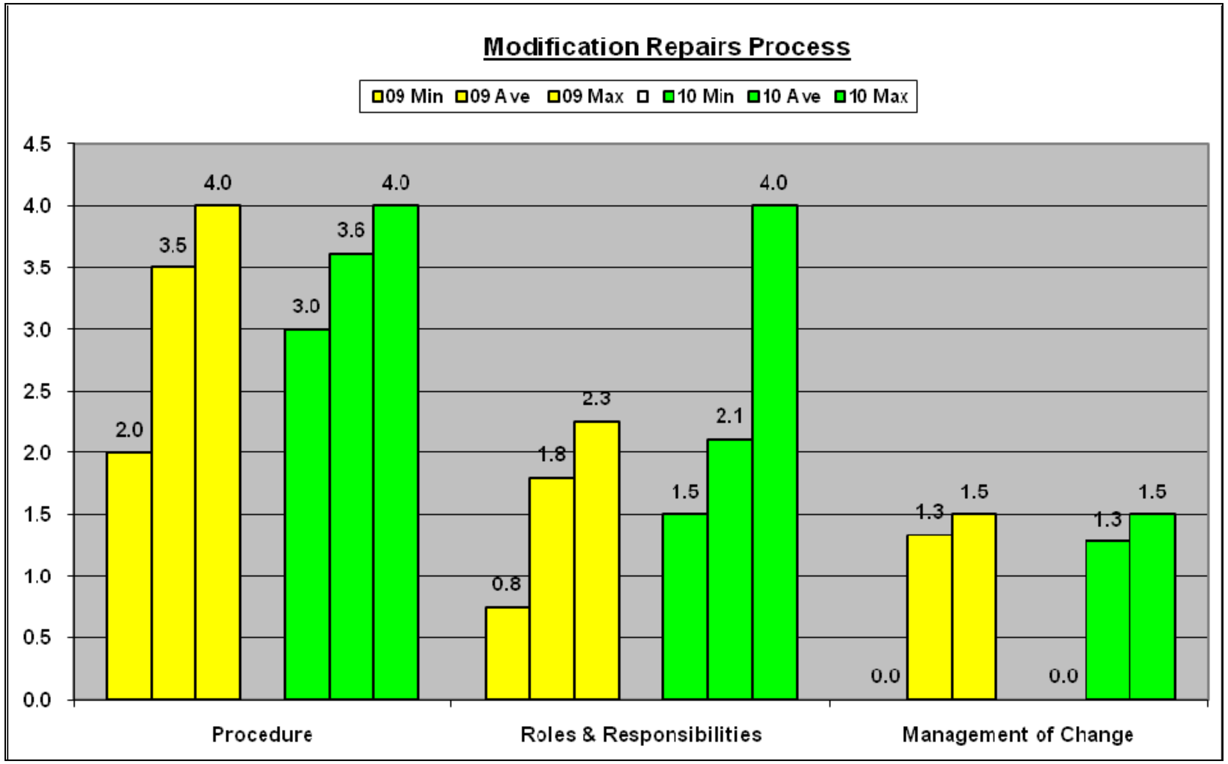


Figure A15 Maintenance, Inspection, Other

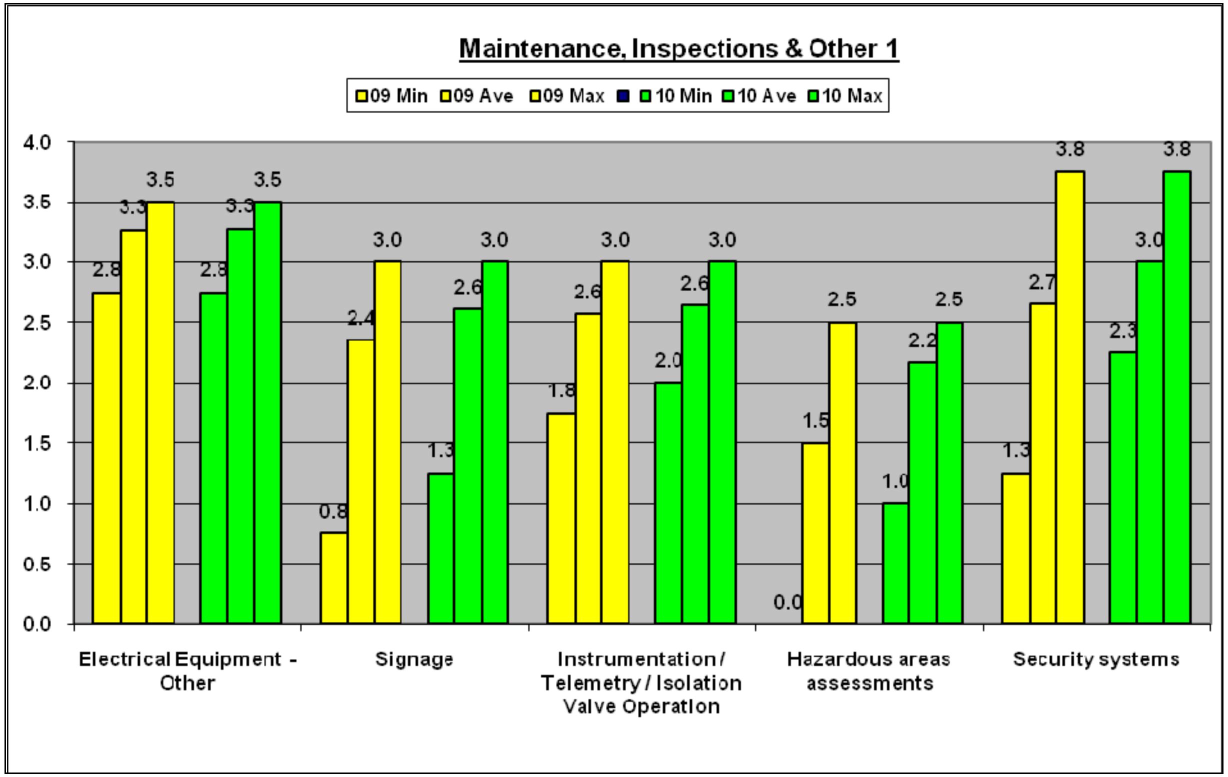


Figure A16 Integrity 1

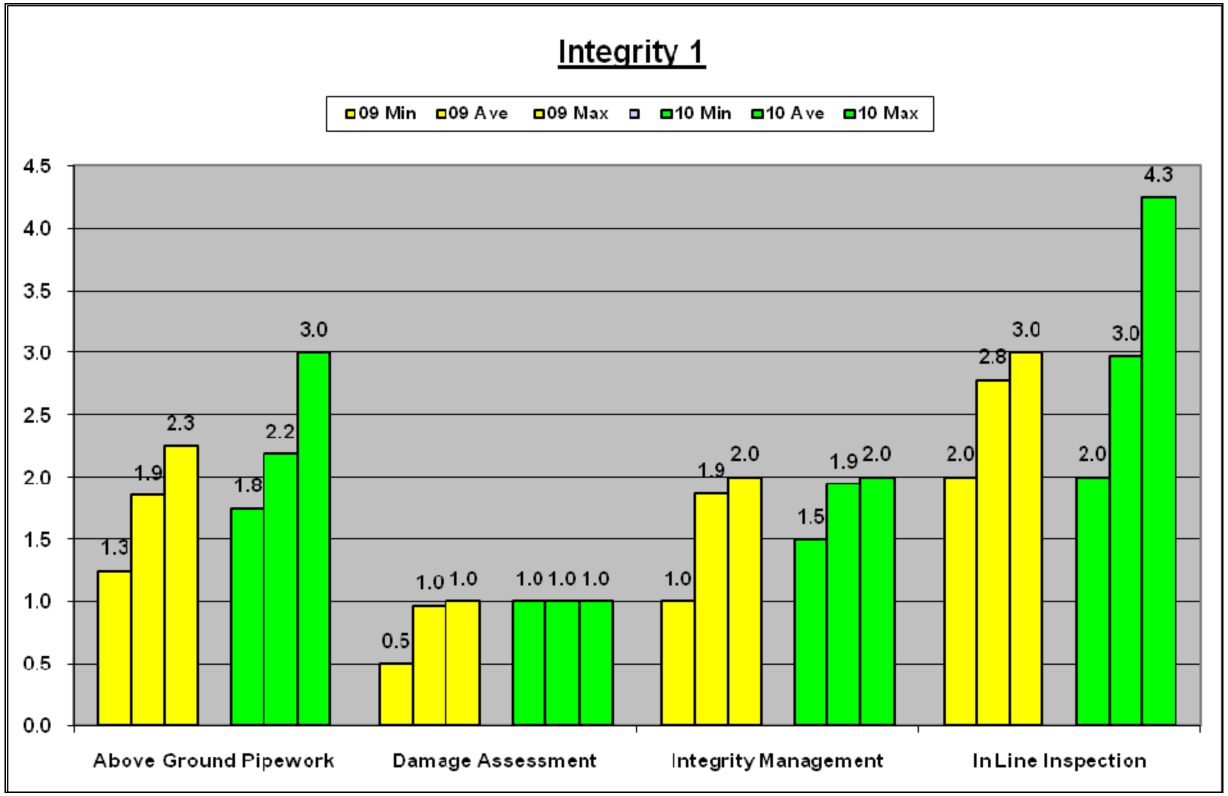


Figure A17 Integrity 2