AFRC Safety Culture

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WHY ATTACK CULTURE?

➢ Existence of a separate safety organization establishes an "us and them" perspective

➢ Aircrew and maintainers are mission oriented

- Process may not be as important until it impacts them directly
- Safety is viewed a competing interest or commodity.

➢ Other factors compete for their attention

- Fiscal resources
- Available schedule
- Organizational reputation (definition of success, success oriented, flexible, independence, etc…)
- Personal risk acceptance level

WHY ATTACK CULTURE?

- Individual perception of value is greatly influence by our group culture
  - <u>Trusted</u> to do the right thing
  - <u>Valued</u> for doing the right thing and contributing - belonging
  - My view of our world is correct and it matters – how do I reconcile the differences

- Culture is the lens through which the operators see process

- Change the lens and you change the value system in the process

NASA AVIATION CULTURE ASSESSMENT HISTORY

➢ Brought in an independent contractor

- ▪ Provides for a high level of confidence in the anonymity of the results

- ▪ Keeps certain results from higher managers

- ▪ Leverage the use of a survey that has been accepted across the larger aviation community - Human Factors Associates

➢ Challenges

- ▪ Interpretation of questions (language)

- ▪ Sharing of Center's results outside their operations may be seen as detrimental

- ▪ Verbiage may need to be adjusted make the question valid within an organization (agency, center, work center)

  - • Does the changed question need revalidation

  - • Can it still be combined with other organizations results (research objective)

- ▪ Can the organization handle another survey- measuring their willingness to take the survey

NASA AVIATION CULTURE ASSESSMENT HISTORY

➤Two tools used to understand the health of the organization

➤Organizational Safety Effectiveness Survey)OSES) – how do individuals see the organization's effectiveness at implementing a safety mindset

➤Culture survey – measures the organization's shared valued of an effective safety environment

FLIGHT CENTER ANALYSIS

ORGANIZATIONAL SAFETY EFFECTIVESS SURVEY

GOAL: HIGH - RELIABILITY ORGANIZATION (HRO)

➢ A culture of trust, shared values, and risk mitigating communication processes.

➢ Communication that provides opportunities for open discussion and improvement.

National Aeronautics and Space Administration

➢ Distributed decision-making, "where the buck stops everywhere."

➢ (Roberts, 1997)

WHAT ARE WE REALLY MEASURING?

➢ **Culture** – the relatively permanent values, beliefs, and motivation shared by leaders, stakeholders, and the organization's members that drive performance and safe practices.

➢ **Climate** – snapshot of employee's shared perception of management's commitment to safety, and the support needed to ensure that resources, standard practices, training and other processes are in place and working.

➢ Survey is not the desired outcome – tool to help find the starting point for change and measure the success of change

Assessment Areas

- Safety Climate – Culture

- Safety Supervision

- Organizational Factors

- Safety Communications

- Workload and Fatigue

- Maintenance

Brief Definition

- Employees share common beliefs and values about safety and reliably follow best practices.

- Safety personnel communicate and promote active safety participation, and lead by example.

- Leadership sets policies, resources safety and promotes open reporting of safety issues.

- Safety personnel ensure that employees get updated and relevant safety critical information

- Management provides adequate staff levels and control daily work routines to avoid fatigue.

- Maintenance operations work "by the book", and carefully manage training, inspections, and shift work practices.

(Ciavarelli, 2016)

Assessment Areas

- Safety Climate – Culture

- Safety Supervision

- Organizational Factors

- Safety Communications

- Workload and Fatigue
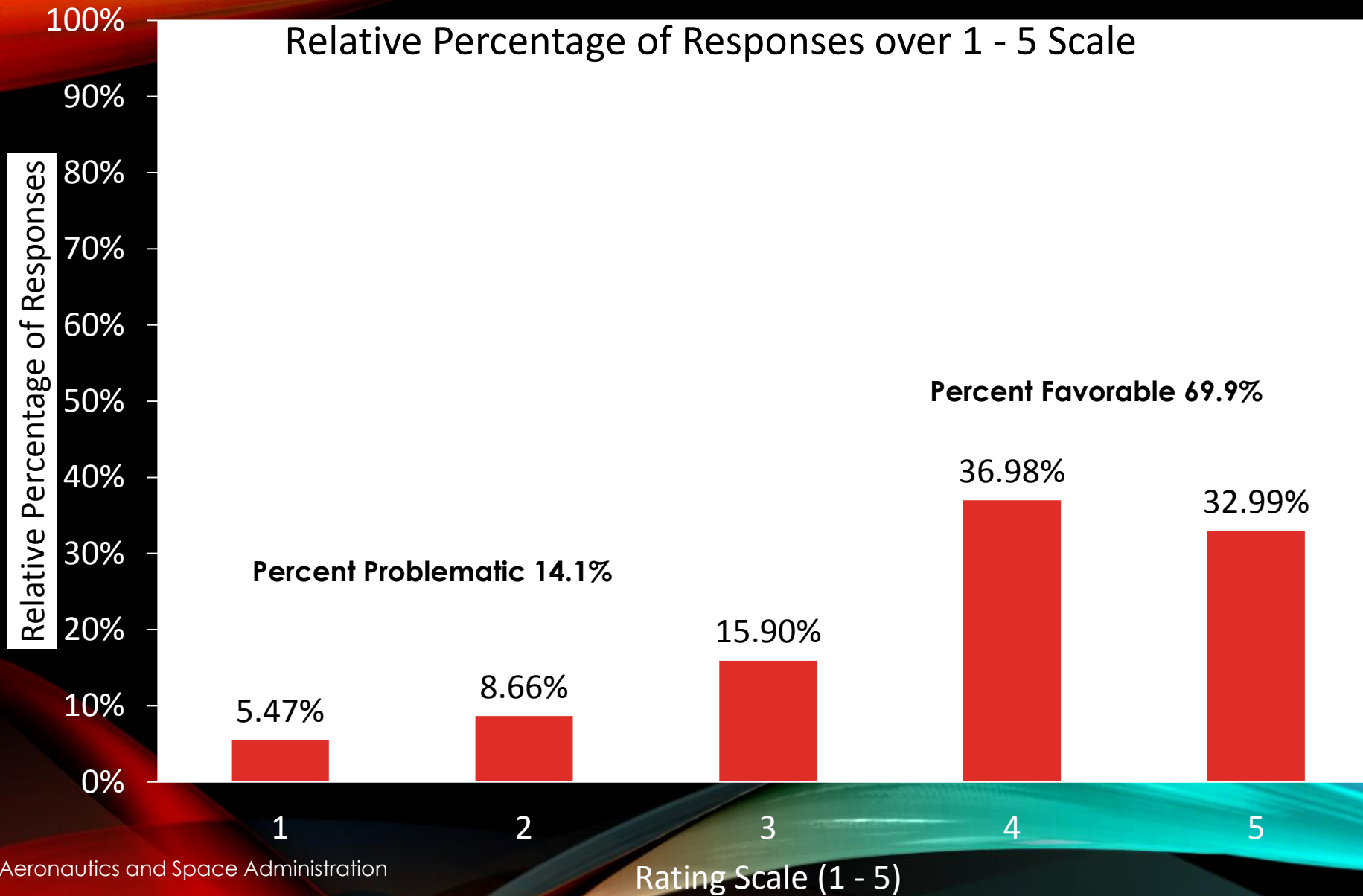
- Maintenance Specific

Sample Survey Item

- All employees feel free to report errors without fear of retribution.

- My supervisor sets the example for compliance with standard procedures.

- My work area has an excellent reputation for high-quality work.

- I get all the information that I need to perform my job safely.

- I seldom feel overburdened by my daily work assignments.

- The Center... has an adequate supply of aircraft mechanics.

(Ciavarelli, 2016)

SURVEY RETURN RATES

Center	2009	2011	2013	2015
➢Ames		44%		55.6%
➢**Armstrong**	**49.6%**	**38%**	**55.6%**	**69.2%**
➢Glenn		75%		87.0%
➢Johnson		54%		42.5%
➢Kennedy		71%		47.6%
➢Langley		56%		86.7%
➢Wallops		70%		64.9%
➢**OVERALL**		**48%**		**57.2%**

2011 Survey Result

Relative Percentage of Responses over 1 - 5 Scale

Percent Favorable 69.9%

Percent Problematic 14.1%

Relative Percentage of Responses

Rating Scale (1 - 5)

National Aeronautics and Space Administration

(Ciavarelli, 2016)

NORMALIZED PERCENT AGREEMENT COMPARISONS (1-5 SCALE)

Scale (1-5)	2009	2011	2013	2015
% Surveyed	50	38	56	69
1. (low)	3.5%	5.5%	3.5%	3.2%
2.	7.5%	8.7%	5.8%	7.4%
Unfavorable	11.0%	14.2%	9.3%	10.6%
3. (neutral)	13.4%	15.9%	12.9%	12.8%
4.	41.9%	37.0%	33.9%	48.7%
5. (high)	32.8%	33.0%	43.9%	27.9%
Favorable	74.7%	70.0%	77.8%	76.6%

ITEMS AT OR ABOVE MEAN OF 4.0

1. I believe that my Center's Aircraft Operations has an effective safety reporting process.

2. My Center's Aircraft Operations Organization provides adequate procedures to prevent injuries.

3. My Center's Aircraft Operations Organization provides adequate resources for preventing personal injury or damage to equipment at our facility.

9. My Supervisor is actively involved in my Center's Aircraft Operations Organization NASA Flight Operations safety programs.

10. Working safely is an integral part of all operations within my Center's Aircraft Operations Organization.

13. My Center's Aircraft Operations Organization supports a climate that promotes safety.

ITEMS AT OR ABOVE MEAN OF 4.0

14. My Supervisor encourages my work area to follow required procedures.

15. Any employee in my work area can request stopping or delaying an operation if he/she believes that an unsafe condition exists.

16. I am comfortable admitting to my Supervisor that I have made a mistake.

17*. It would be difficult for me to ask my Supervisor for more time to complete a task.

18. There is genuine commitment to safe work practices in my Center's Aircraft Operations Organization.

ITEMS AT OR BELOW 3.0 MEAN

67*. My Center's Aircraft Operations Organization will likely face a critical pilot shortage in the near future, due to impending retirements and natural attrition.

78. My Center's Aircraft Operations Organization has an effective process in place to mitigate any risk due to an aging workforce.

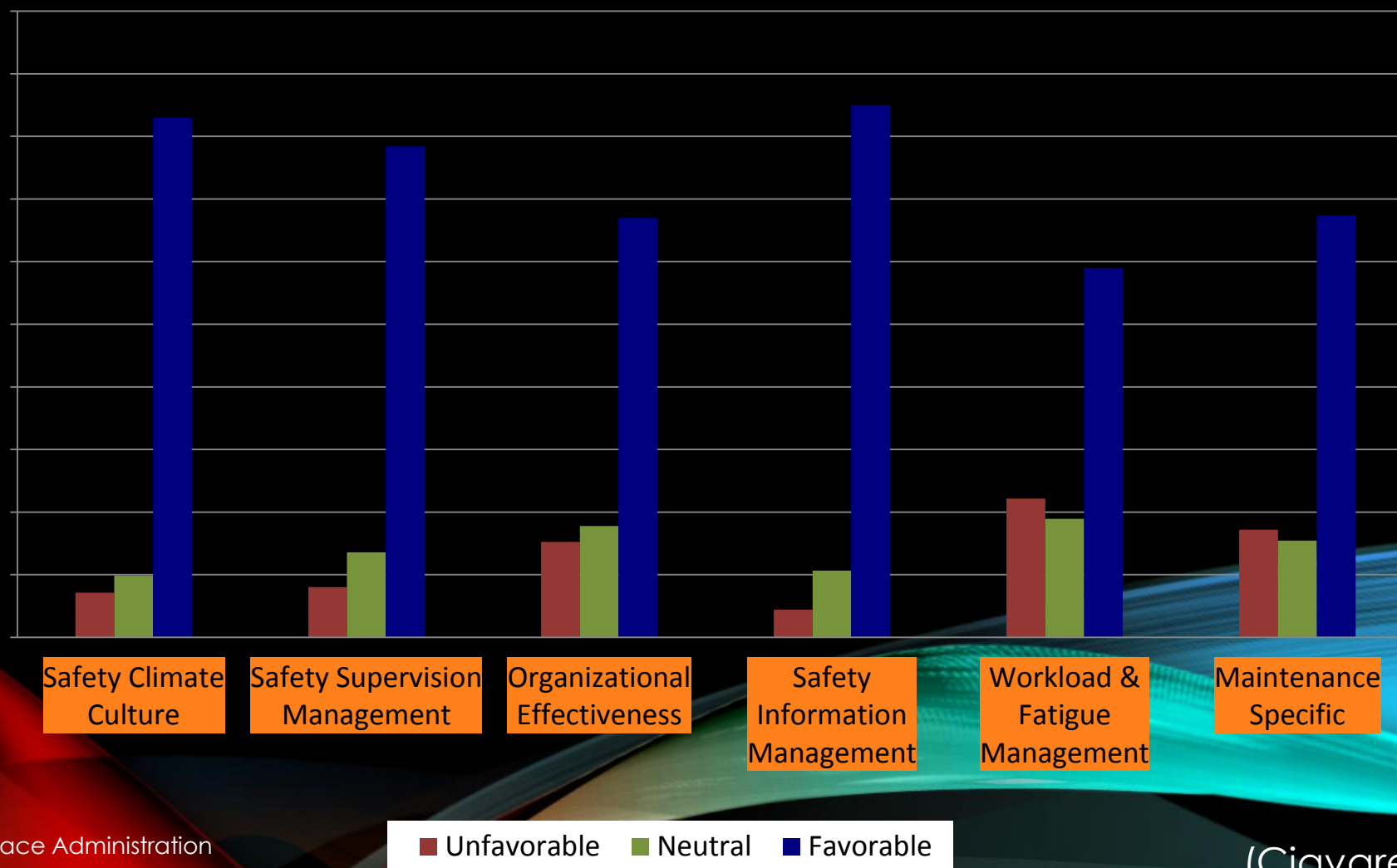80*. Some aspects of safety oversight are overdone and hinder work progress.

NORMATIVE COMPARISON ACROSS DOMAINS

Comparison	% Problematic	% Favorable
Aerospace	7.97%	79.67%
Air Medical	14.98%	79.12%
General Aviation – Ground	14.42%	73.86%
Oil and Gas transport	19.22%	64.24%
Medical Facility – ICU	7.11%	77.57%
Electric Power Utility	11.46%	72.95%
Air Traffic Control (2006)	50.35%	38.83%
NASA Flight Centers 2009	5.54%	86.16%
NASA Flight Centers 2011	11.4%	75.5%
Dryden Center 2009	**11.04%**	**74.6%**
Dryden Center 2011	**14..1%**	**69.9%**

(Ciavarelli, 2016) 16

Percent Response Distribution by OSES Factors Taken Across All NASA Centers – 2015 Survey

Legend: Unfavorable, Neutral, Favorable

Categories: Safety Climate Culture, Safety Supervision Management, Organizational Effectiveness, Safety Information Management, Workload & Fatigue Management, Maintenance Specific

(Ciavarelli, 2016)

ITEMS WITH MEAN AT OR BELOW 3.0

2009 Survey

38* -- Center Flight Operations does not provide adequate staffing at my location.

67* -- Center Flight Operations will likely face a pilot shortage

76 – Center has ample supply of pilots for aircraft flown now

77* – Center has not adequately prepared employees for change

80* -- Some aspects of safety are overdone/hinder work progress

75 – Substantial increase in workload might lead errors

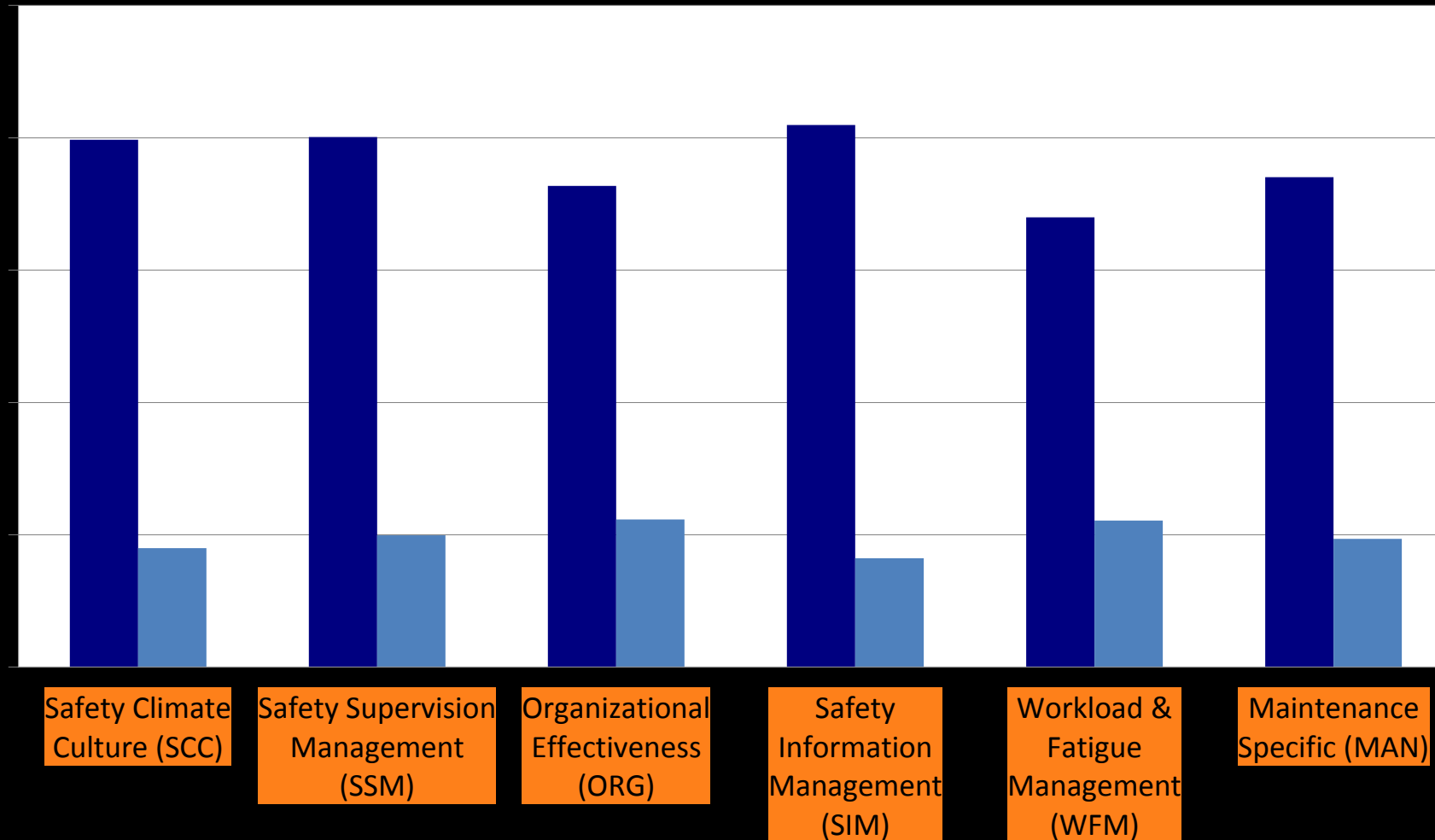**78 – NASA has risk mitigation procedure for aging pilot population**

2011 Survey

67*. My Center's Aircraft Operations Organization will likely face a critical pilot shortage in the near future, due to impending retirements and natural attrition.

78. My Center's Aircraft Operations Organization has an effective process in place to mitigate any risk due to an aging workforce.

80*. Some aspects of safety oversight are overdone and hinder work progress.

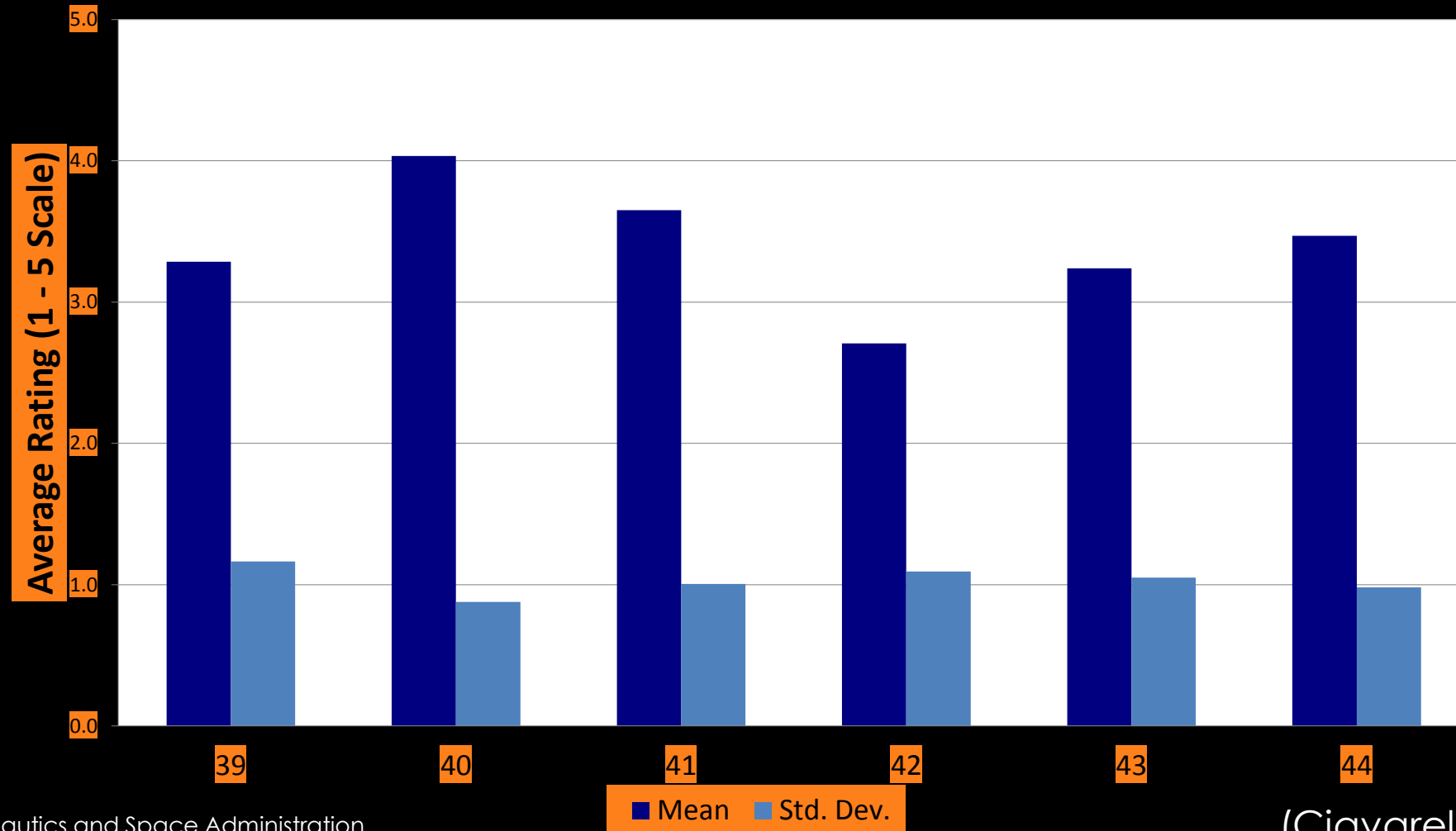**Average and Standard Deviation – by OSES Factors - Taken Across all NASA Centers- 2015**

Average Rating (1-5 Scale)

- Safety Climate Culture (SCC)
- Safety Supervision Management (SSM)
- Organizational Effectiveness (ORG)
- Safety Information Management (SIM)
- Workload & Fatigue Management (WFM)
- Maintenance Specific (MAN)

(Ciavarelli, 2016)
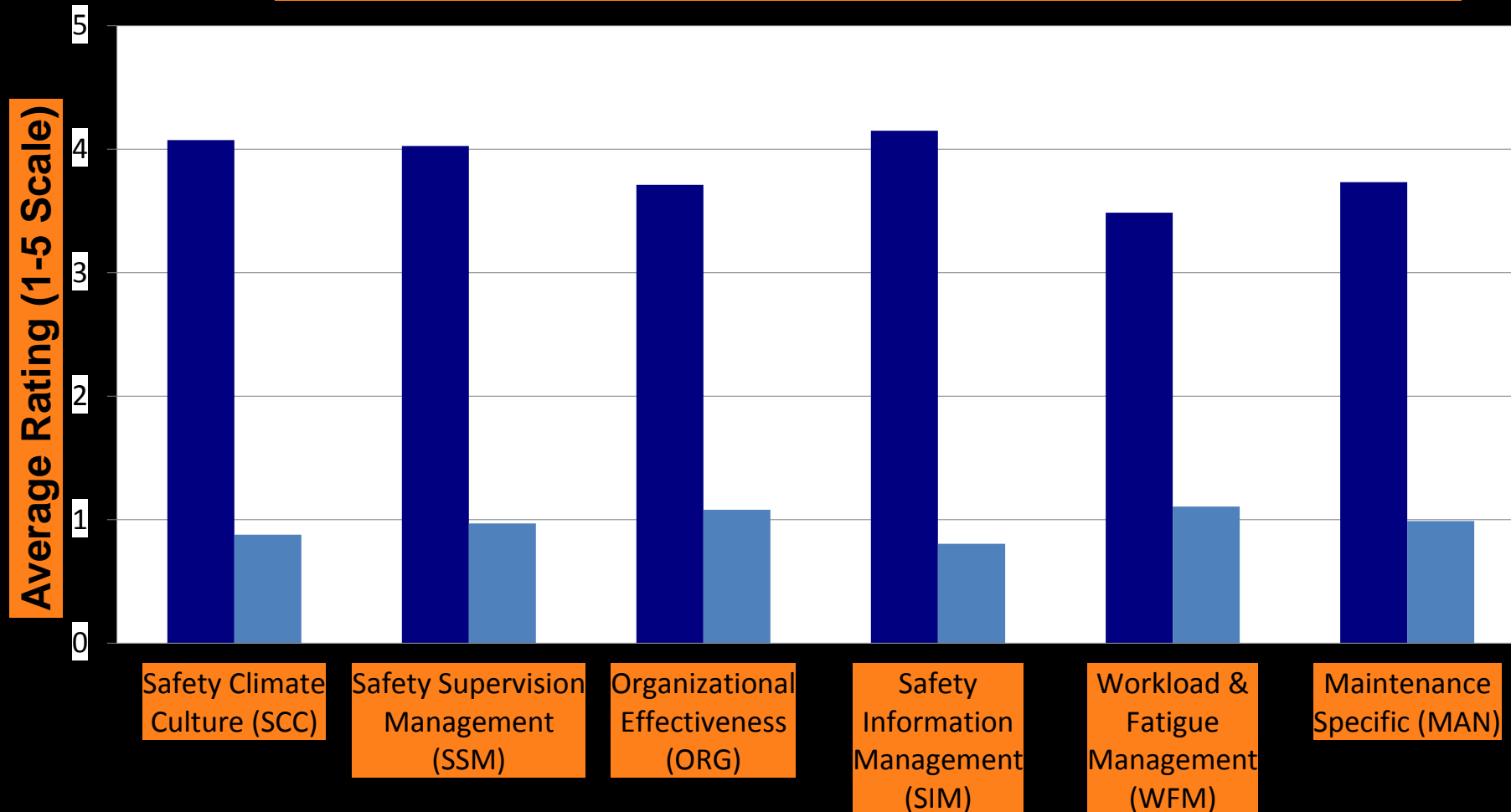
Average and Standard Deviation - OSES

Average Rating (1 - 5 Scale)

Safety Climate Culture (SCC)

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Organizational Effectiveness (ORG)

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Workload & Fatigue Management (WFM)

Maintenance Specific (MAN)

**Average and Standard Deviation
Workload and Fatigue Management (WFM)**

(Ciavarelli, 2016)

➤ As shown most of the "negativity" concerns high workload conditions and a perceived inadequacy in staffing levels.

➤ So, it is not surprising that ratings of the assessment Area – Organizational Effectiveness are affected: Items rated near or below 50% are:

- Item 24 – Employee Morale

- Item 26 – Organizational Change Management
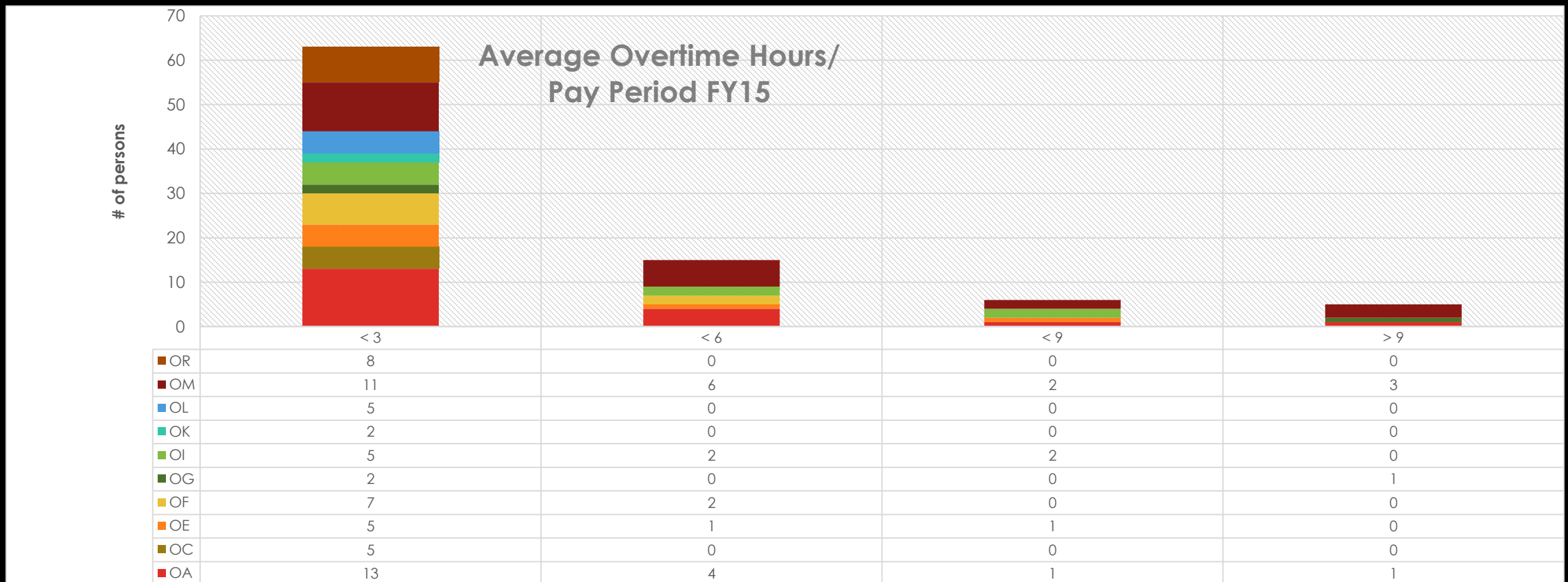
- Item 29 – Communications up/down organization

CONCLUSIONS RECOMMENDATIONS

➢ Conclusions

- Safety program effectiveness are mainly positive.
- Staffing, resources, scheduling and personnel workload show a negative trend.

➢ Recommendations

- Share the results of the survey with all personnel in a timely manner.
- Establish dialogue with management and workers on key organizational and workload issues – Verify nature of a problem and find the root cause
- Take a concrete action
- Followup with reassessment and communicate result

Average Overtime Hours/ Pay Period FY15

# of persons

	< 3	< 6	< 9	> 9
OR	8	0	0	0
OM	11	6	2	3
OL	5	0	0	0
OK	2	0	0	0
OI	5	2	2	0
OG	2	0	0	1
OF	7	2	0	0
OE	5	1	1	0
OC	5	0	0	0
OA	13	4	1	1

RECOMMENDED ACTION

- Develop and implement a specific strategy to reduce the Center's use of overtime eliminate all personnel working an average of 9 hours of overtime and reduce personnel working 6-9 average hours of overtime per pay period for any person by 50%.

- Eliminating uncompensated overtime.

- Reducing the number of RDO days with flight activity in FY16 by 20% of the average employed in FY14(21) and FY15(10). Target is 12.

- Initiate process improvements to improve mission throughput by 15 percent in one area where understaffing is critical.

NASA- Armstrong
Safety Culture Survey
General Results
2014

National Aeronautics and Space Administration

Miriam Rodon-Naveira

Reporting Culture (RC): *We report our concerns.* Identification of hazards or safety concerns is encouraged, including a system that's easy to use. The reporting system maintains anonymity and is separate from the disciplinary processes. Useful feedback based on reporting is quick and insightful. An atmosphere of trust exists between managers and workers, with employees knowing important information will be voiced, heard, and acted on appropriately.

Flexible Culture (FC): *We change to meet new demands.* The organization effectively balances and adapts to changing demands while managing complex technologies and maintaining productivity. A healthy flexible culture uses safety data to make meaningful changes when there's a concerning trend or issue.

(Adapted from Reason, Weigmann, and Zhang & Joint Planning and Development Office (JPDO), Safety Working Group

Learning Culture (LC) : *We learn from our successes and mistakes.*   Collecting, assessing, and sharing from experience is a priority. Information is available to everyone from novice to expert. Values and commits to proactively "learn from our mistakes", both formally and informally.

Engaged Culture (EC): *Everyone does their part.*   All members regardless of status or occupation are involved and actively participate in safely accomplishing the mission. The key is to have leaders and employees who demonstrate they value safety by "walking the talk."

Just Culture (JC): *We have a sense of fairness.* Balances the need for discipline when warranted, with rewards when earned. People are held accountable for deliberate violations of rules and recognized for outstanding performance. There's a clear understanding of acceptable and unacceptable behaviors. There's a sense of fairness about how business is conducted. where people aren't punished for reporting and aren't afraid of reprisal if they do.
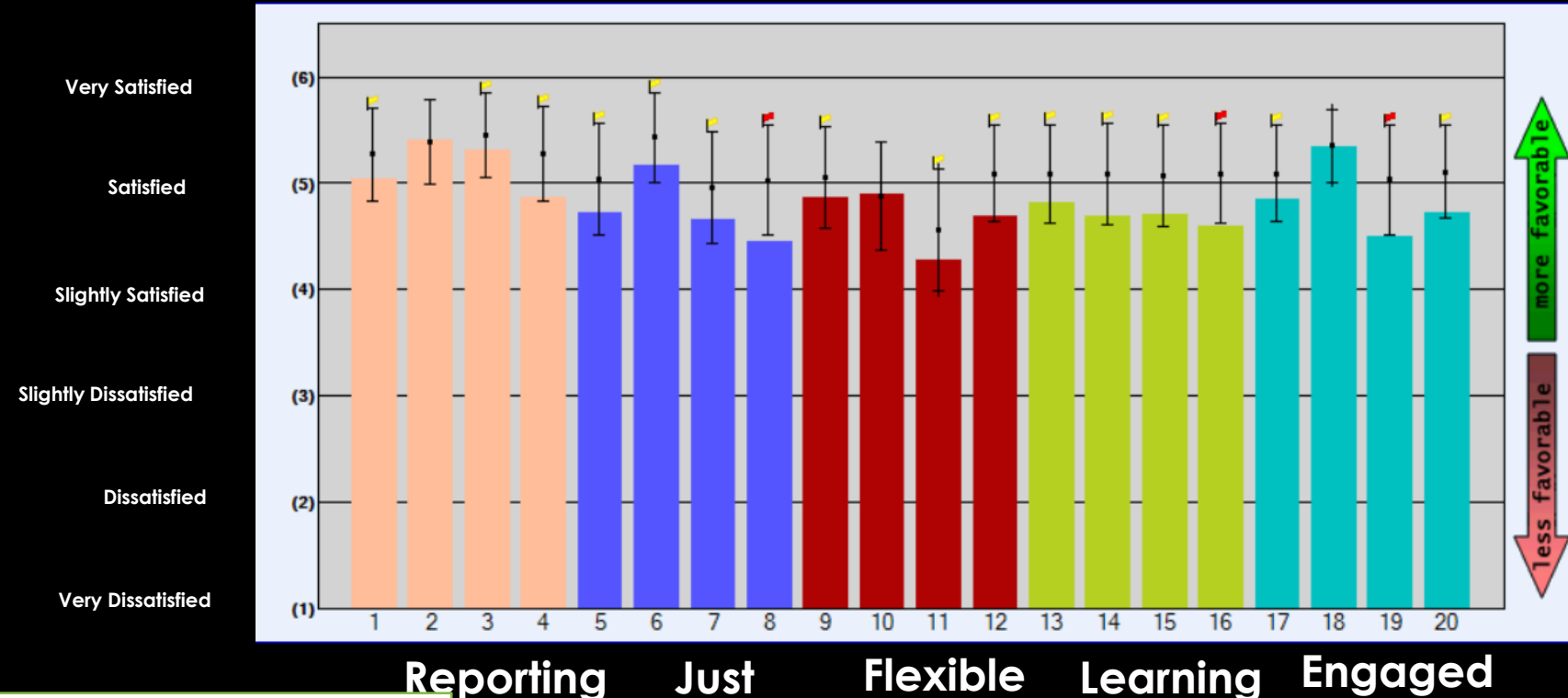
Resistance Factors

Personal performance

Summary Overall Distribution of Results

2014- Armstrong Survey compared to Agency

Graph Of Mean For Dryden Responses Compared With Mean And Standard Deviation with respect to All Agency

Reporting   Just   Flexible   Learning   Engaged

Legend
Lines and Flags:
 (**black dot**) Mean for all respondents
 (Yellow flag) Mean is less than Agency mean but   within one-half standard deviation
 (Red flag)   Mean is more than one-half standard deviation below the Agency mean

Armstrong responses are below most of the overall Agency respondents. We also have three Red Flags:
 8- Appropriate Action is taken if safety rules are violated (JC)
 16- My Center uses safety information from past experiences in future decision making (LC)
 19 – Leaders demonstrate they value safety by "walking the talk" (EC)
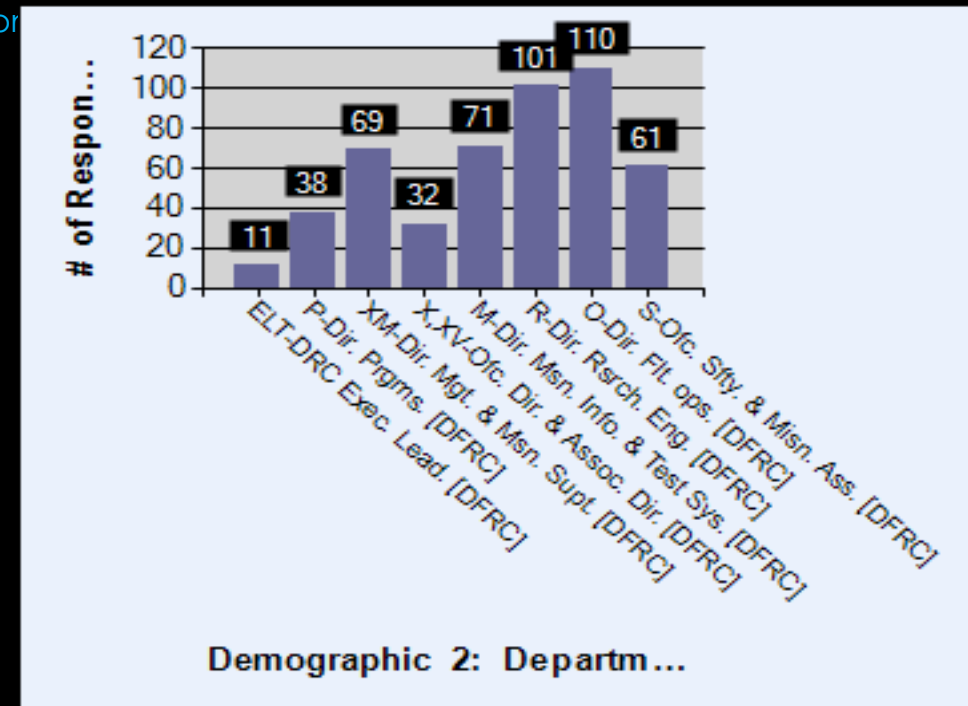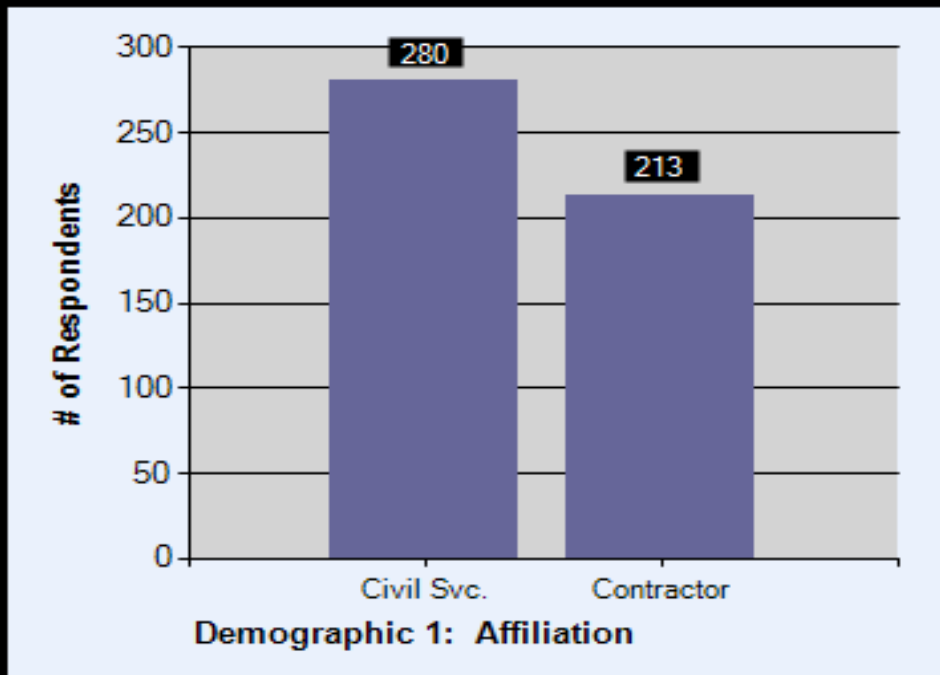
DEMOGRAPHICS RESULTS

Respondents

Survey 2014 --- 493 of 1307 Requested Surveys Completed = 37.7% Participation

50.0% of the Civil Servants workforce responded

28.3% of the Contractor workforce respon

Good turn-out from most organizations
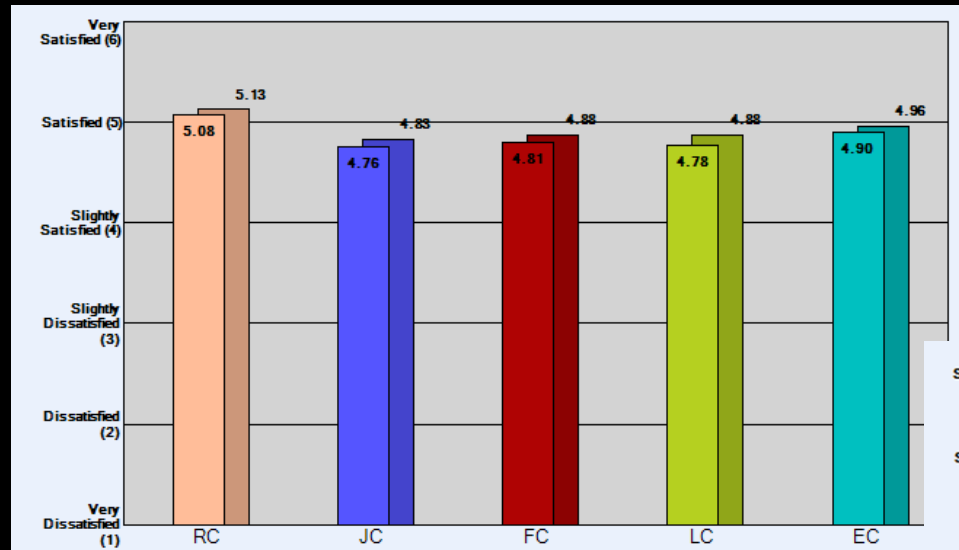

Demographic 1: Affiliation

Demographic 2: Departm…

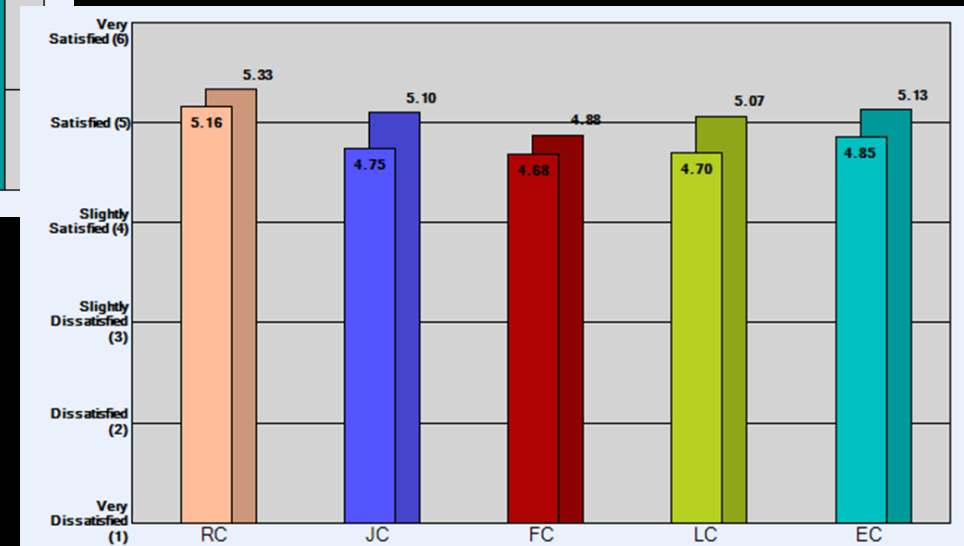# Comparison of Likert Results to Agency Survey 2011 and Survey 2014

Mean scores by Category for Dryden (brighter, foreground bars) vs. The Agency (darker, background bars)

Armstrong Respondents vs. Agency Respondents

2011

2014

Armstrong follows the same pattern of responses as the overall Agency, just lower. The overall Agency increased the "satisfaction" in almost every factor, while Armstrong decreased, except in the Reporting Factor.

SAFETY DAY

➢ Annual event to focus on promoting a positive Safety Culture across the Center

- Time to stop and think (this one should be mandatory-boss must be there)

➢ Led by Safety Organization

- Team has participants from all Center organizations
- Presentations focus on personal safety not necessarily job related
- Afternoon reserved for individual organization sessions to focus on job-related safety topics
- Coincides with the Safety Culture Survey
- Includes a feedback

LESSONS LEARNED

- Choose survey dates to allow for good response
  - Current workload & last survey (distraction from job)
- Third Party vendor enhances
  - Accessibility (outside the work firewall)
  - Anonymity
- Pick one thing to correct and make it happen
  - Involve employees in the solution and implementation
  - Design it around a tangible goal/result
  - Result will be multi-dimensional impacting several cultural areas
- Continual Improvement (improved mishap rate) is the goal (not the survey result)
  - Communicate progress and the intermediate steps

CREDITS

➢ Ciavarelli, A.P. (2016, January). *Executive Summary Report for the Organizational Safety Effectiveness Survey (OSES) for NASA Flight Centers,* 2015 Survey Results, Lake Oswego, OR: Human Factors Associates.