



# Air Force Materiel Command

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## Air Force Competency Management

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Mr. Andy Jeselson

HQ AFMC/ENS

AFMC Engineering and Technical  
Management Directorate  
Systems Engineering Division

(937) 257-6460

[andrew.jeselson@us.af.mil](mailto:andrew.jeselson@us.af.mil)

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***One Team, Delivering Capabilities to Fly, Fight & Win... Today & Tomorrow***

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# Questions?

Air Force Senior Leader,  
Competency Management:  
Dr. Ken Barker, SL, Sys Eng  
AFLCMC/EN-EZ  
(937) 255-7213  
[kenneth.barker.3@us.af.mil](mailto:kenneth.barker.3@us.af.mil)

Competency Management  
Presenter:  
Andy Jeselson  
HQ AFMC/ENS  
(937) 257-6460  
[andrew.jeselson@us.af.mil](mailto:andrew.jeselson@us.af.mil)

Competency Management  
Sharepoint Site developer:  
Geoff Oliver  
AFLCMC/EZST  
(937) 656-7882  
[geoffrey.oliver.4@us.af.mil](mailto:geoffrey.oliver.4@us.af.mil)



# What is Competency Management?

- Personnel position management tool, based on skills, education, experience
  - Documents position requirements, employee skill levels, and training needs
  - Provides data supporting enterprise-level management of AF employees
- Benefits to employee:
  - Enhances communication between supervisors and employees
  - Helps employees assess and document their own skills
  - Clarifies how to become competitive for future desired positions
- Competency Management is **not** used for Human Resource actions such as:
  - Job interviews
  - Unit Manning Document (UMD) updates
  - Acquisition Demo evaluation processes
- AFLCMC/EN-EZ developed automated Competency Mgt tool (runs on SharePoint)
  - Supervisors import taxonomy data/updates into the tool
  - Employees should review their competency data to ensure proper assessment

Competency Management defines workforce requirements, quantifies gaps in workforce capabilities and helps leaders manage the workforce to best meet AF needs



# Purpose of Competency Management

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- Understand all technical disciplines required to develop and sustain our complex systems
  - Even those not typically provided by gov't employees
- Understand both supply & demand of our technical disciplines
- Understand the gaps between supply and demand
- Deliberately work to close the gaps and/or mitigate the risk associated with the gaps
- Deliberately plan for successions
- Develop the technical workforce
- Influence organization structure and processes consistent with competency taxonomy

**Ensuring we Have the Right Skills to Develop and Support World-Class Weapon Systems**



# Fundamentals of Competency Management

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- **List of required technical disciplines**
  - Grouped into Competencies and Domains for convenience
  - We call this our Taxonomy (domains, competencies, disciplines, proficiency levels)
- **Database**
  - We use SharePoint with Excel as a reporting tool
- **Skill Requirements for Every Position are Documented**
  - We call this the demand
- **Workforce Skills are Documented**
  - We call this the supply
- **Gaps are a Matter of Record**
  - Provides accuracy and precision in all discussions pertaining to engineering workforce requirements



# Competency Taxonomy

## Terms of Reference

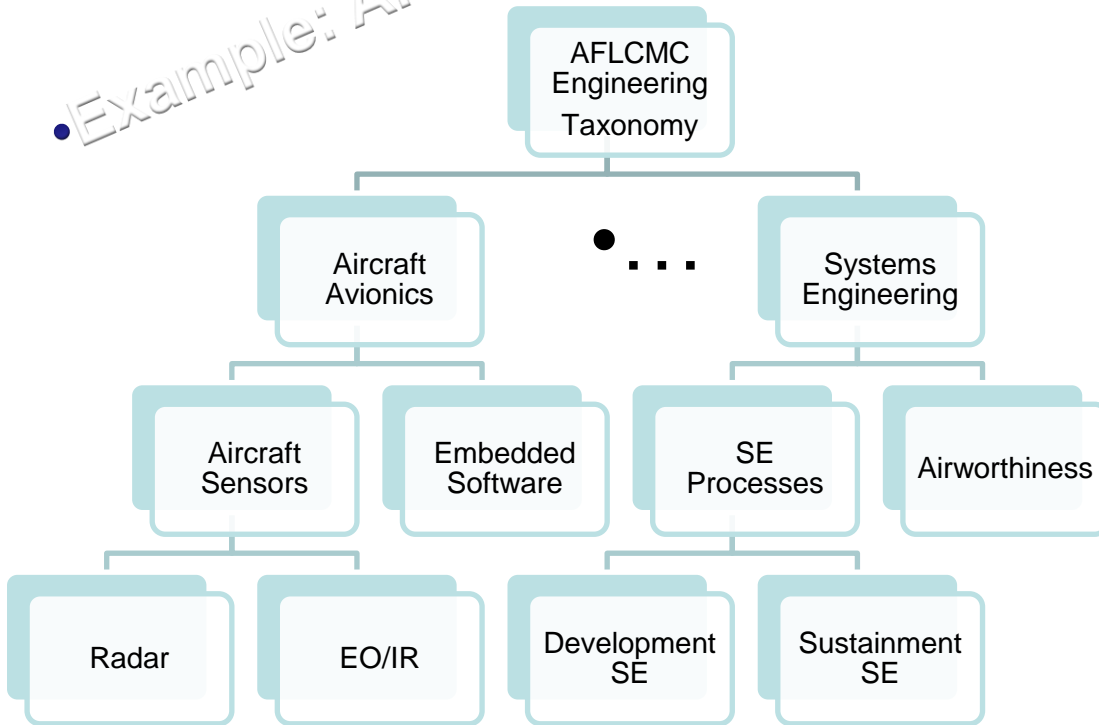
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- Taxonomy similar to Defense Competency Assessment Tool (DCAT) Hierarchy (DoDI 1400.25-V250)
- A **domain** is a logical collection of competencies, consistent with AFLCMC's organization and portfolio
- A **competency** is a logical collection of technical disciplines
- A **technical discipline** (aka "Skill") is a set of KSAs, education, and experiences necessary to perform a needed functions
  - Knowledge, Skill, Ability (KSA)-based; NOT a Duty-title
  - A skill we need that we can expect to be developed or acquired in our "Total" technical workforce
    - Total Force: Gov't Civilian + Military + FFRDC + Support Contractor
  - **5 Proficiency Levels per technical discipline workforce**
    - Expert, Advanced, Intermediate, Basic, Awareness
    - Indicates degree to which employees have mastered a competency



# AF's Engineering Taxonomy

• Example: AFLCMC



- • **AFLCMC one of 6 AF Centers**  
- All developing taxonomy appropriate to their mission/workforce
- • **11 Domains**
- • **58 Competencies**
- • **181 Technical Disciplines**  
- With proficiency-criteria defining expert, advanced, intermediate, basic, awareness

**Acknowledges AF needs an engineering workforce with multiple types of deep engineering skills to execute AF's complex acquisition and sustainment portfolio**



# 5 Proficiency Levels

## Example: Human Systems Integration

3.5 Human Systems Integration			Applies tools, techniques, and methods to make explicit tradeoffs across the HSI domains (i.e. manpower, personnel, safety, environment and occupational health, training, human factors engineering, habitability, survivability) facilitating optimization of total system performance across the lifecycle. Provides analyses and assessments of complex relationships during system design and integration to significantly and positively influence a human-centric focus.					
3.5.1 Human Systems Integration								
	Technical Characteristics	General Characteristics	Education Level	Specific Training	Yrs Technical Experience (Typical)	Type of Experience	Certifications & Endorsements	KSA's
<b>Level 1 - Awareness (aka Active Trainee)</b>	Familiarity in specific area; very limited experience; requires extensive consultation or guidance	Applies the competency in the simplest technical situations or as an aid to understanding more complex technical systems issues	N/A	AFIT's SYS 169, DAU's CLE 062, Required Reading - USAF HSI Handbook	0 to 6 Mos.	Entry Level of Experience or Active Trainee with 0-6 Mos. of HSI specific work.	N/A	Human Systems Integration to unfamiliar program stakeholders to include an appreciation of HSI acquisition policy requirements, the value of emphasizing HSI through a program's lifecycle, and a familiarization with each of Air Force's 9 HSI domains. Has an appreciation for how HSI fits into the overall systems engineering process.
<b>Level 2 - Basic</b>	Applies standard techniques to perform moderately complex tasks; requires frequent guidance	Applies competency in somewhat difficult situations	N/A	Level 1 specific training plus AFIT's SYS 269, DAU's CLL 008	6 Mos to 2	Limited Breadth of Experience Contributor to the creation of a HSI plan, accomplished work effort to complete a limited portion of the HSI plan	N/A	Skill Level 1 KSAs, plus the ability to articulate DoD and Air Force policy on HSI requirements to uninformed program stakeholders when appropriate to ensure sound HSI emphasis. Has familiarity with available options for HSI reach back capability.
<b>Level 3 - Intermediate</b>	Applies & adapts standard techniques to perform complex tasks; requires occasional guidance	Applies competency in difficult situations	Bachelor of Science	Level 2 specific training plus DAU's CLE 062	3 to 5	Average Breadth of Experience Co-author of an HSI plan, managed work effort to complete a large portion of the HSI plan.	N/A	Skill Level 2 KSAs, plus the ability to perform trade-offs across the various HSI domains. Integrates HSI planning and activities into the systems engineering process. Collaborates with the entire program team (program management, logistics, test, engineering SMEs) to facilitate HSI implementation.
<b>Level 4 - Advanced</b>	Independently applies and adapts standard techniques to perform complex tasks; requires minimal guidance	Applies competency in considerably difficult situations	Bachelor of Science	Level 3 specific training plus DAU's CLE 009 and CLE 039	6-8	Expanded Breadth of Experience Primary author of the program office HSI plan, manages the work effort to complete a significant portion of the HSI plan.	N/A	Skill Level 3 KSAs, plus that ability to formulate and structure approaches for trade-offs across the HSI domains, leads others in the conduct of HSI trade-offs.
<b>Level 5 - Expert</b>	Uses creativity, foresight and mature judgment in anticipating and solving unprecedented problems	Applies competency in exceptionally difficult situations; serves as a key resource and advises others	Bachelor of Science	Level 4 specific training	9+	Wide Breath of Experience Manages the program office planning and implementation of HSI.	Naval Post Graduate School or Air Force Institute of Technology HSI Certificate (Program unless you have a HSI	Skill Level 4 KSAs, plus establishes and leads program office HSI implementation strategy.





# Competency Manager Roles & Responsibilities

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- **Define their competency and the technical disciplines within their competency (taxonomy)**
- **Document the specific KSAs, education, training, tool proficiency, and experience required to maintain proficiency in each technical discipline/competency**
  - Differentiate for the various proficiency levels
- **Recommend additions and deletions to their taxonomy based on existing and emerging needs of the AF (implies ongoing gap analysis)**
- **Validate skill & proficiency assertions – both org requirements and employee skills**
  - Requires broad understanding of which org positions align to their taxonomy
- **Competency Managers “*should be*” a/the senior engineer (usually a supervisor) with most seniority/proficiency at the competency level**



# Org Leaders

## Roles & Responsibilities

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- **Data on Every Employee (Supply)**
  - Ensure the Competency Management Database contains all their employees' correct data
- **Document Requirements (Demand)**
  - Using taxonomy, document skill & proficiency requirements for every position in their organization
  - Including new positions for new programs added to your org
- **Manage Your Technical Workforce**
  - Ensure your technical workforce is doing technical work

**Org Leaders are 2-Ltr DOEs & EN Division Chiefs**



# AFLCMC/EN-EZ Status

## (on 23 May 2016)

Functional	Employee Skills				Show All Rows	Current Authorizations						
EN	Employee Count	Employees with Skills Declarations	Employees with no Skill Declarations	Employees % with Skills Declaration	Org	Current Authorizations Count	Authorizations with current Skills Declarations	Authorizations with no current Skills Declarations	Authorizations % with current Skills Declarations	Authorizations with future Skills Declarations	Authorizations with no future Skills Declarations	Authorizations % with future Skills Declarations
AQ	1	1	0	100%	AQ	1	1	0	100%	1	0	100%
AZ	6	6	0	100%	AZ	6	6	0	100%	6	0	100%
EB	326	309	17	95%	EB	350	343	7	98%	343	7	98%
EN	25	24	1	96%	EN	32	15	17	47%	15	17	47%
EZ	349	332	17	95%	EZ	372	339	33	91%	333	39	90%
HB	326	309	17	95%	HB	382	338	44	88%	334	48	87%
HI	72	64	8	89%	HI	87	82	5	94%	82	5	94%
HN	303	287	16	95%	HN	326	252	74	77%	250	76	77%
IN	10	10	0	100%	IN	11	11	0	100%	11	0	100%
LG	0	0	0	100%	LG	1	0	1	0%	0	1	0%
LP	154	154	0	100%	LP	163	161	2	99%	161	2	99%
LZ	80	35	45	44%	LZ	89	33	56	37%	33	56	37%
OZ	8	7	1	88%	OZ	8	7	1	88%	7	1	88%
SE	26	26	0	100%	SE	28	28	0	100%	28	0	100%
WI	257	247	10	96%	WI	298	274	24	92%	271	27	91%
WK	94	92	2	98%	WK	107	105	2	98%	105	2	98%
WL	331	322	9	97%	WL	391	321	70	82%	319	72	82%
WN	397	394	3	99%	WN	443	431	12	97%	430	13	97%
WW	588	556	32	95%	WW	685	581	104	85%	539	146	79%
XP	1	1	0	100%	XP	1	1	0	100%	1	0	100%
XZ	80	80	0	100%	XZ	85	84	1	99%	84	1	99%
<b>Total</b>	<b>3434</b>	<b>3256</b>	<b>178</b>	<b>94.8%</b>		<b>3866</b>	<b>3413</b>	<b>453</b>	<b>88.3%</b>	<b>3353</b>	<b>513</b>	<b>86.7%</b>

### Expectations:

- Requirements @ 100%
  - Current and Future
- Workforce at 98%
  - Accounts for RMIS lag

Additional Positions Required (current)								Additional Positions Required (future)					Experience and Training			
Org	Current Requirements Count	Current Requirements with current Skills Declarations	Current Requirements with no current Skills Declarations	Current Requirements % with current Skills Declarations	Current Requirements with future Skills Declarations	Current Requirements with no future Skills Declarations	Current Requirements % with future Skills Declarations	Org	Future Requirements Count	Future Requirements with Skills Declarations	Future Requirements with no Skill Declarations	Future Requirements % with Skills Declaration	Org	Employees	No Entry	% Current
AQ	0	0	0	100%	0	0	100%	AQ	0	0	0	100%	AQ	1	0	100%
AZ	1	1	0	100%	1	0	100%	AZ	2	2	0	100%	AZ	6	0	100%
EB	117	117	0	100%	117	0	100%	EB	25	25	0	100%	EB	326	45	86%
EN	18	0	18	0%	0	18	0%	EN	15	0	15	0%	EN	25	10	60%
EZ	84	82	2	98%	82	2	98%	EZ	39	35	4	90%	EZ	349	72	79%
HB	857	847	10	99%	521	336	61%	HB	230	186	44	81%	HB	326	101	69%
HI	186	123	63	66%	122	64	66%	HI	98	20	78	20%	HI	72	20	72%
HN	1	1	0	100%	1	0	100%	HN	0	0	0	100%	HN	303	114	62%
IN	0	0	0	100%	0	0	100%	IN	0	0	0	100%	IN	10	6	40%
LG	0	0	0	100%	0	0	100%	LG	0	0	0	100%	LG	0	0	100%
LP	45	45	0	100%	45	0	100%	LP	13	13	0	100%	LP	154	0	100%
LZ	0	0	0	100%	0	0	100%	LZ	0	0	0	100%	LZ	80	59	26%
OZ	5	0	5	0%	0	5	0%	OZ	0	0	0	100%	OZ	8	6	25%
SE	38	38	0	100%	38	0	100%	SE	1	1	0	100%	SE	26	9	65%
WI	196	135	61	69%	104	92	53%	WI	50	29	21	58%	WI	257	77	70%
WK	8	8	0	100%	8	0	100%	WK	9	9	0	100%	WK	94	16	83%
WL	127	106	21	83%	99	28	78%	WL	26	23	3	88%	WL	331	64	81%
WN	110	110	0	100%	109	1	99%	WN	9	9	0	100%	WN	397	82	79%
WW	254	216	38	85%	153	101	60%	WW	271	260	11	96%	WW	588	127	78%
XP	0	0	0	100%	0	0	100%	XP	0	0	0	100%	XP	1	1	0%
XZ	42	42	0	100%	42	0	100%	XZ	18	18	0	100%	XZ	80	13	84%
<b>Total</b>	<b>2089</b>	<b>1891</b>	<b>198</b>	<b>90%</b>	<b>1442</b>	<b>647</b>	<b>89%</b>		<b>611</b>	<b>611</b>	<b>0</b>	<b>100%</b>		<b>822</b>	<b>76.1%</b>	



# Gaps

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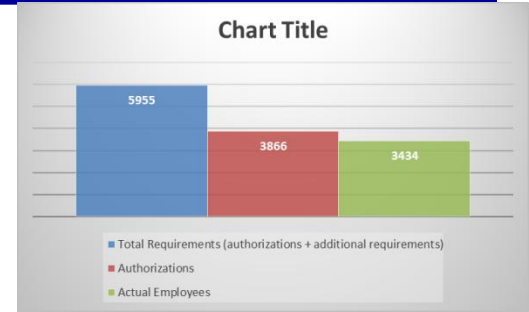
- **Gaps in numbers**
- **Gaps in skills (technical disciplines)**
- **Gaps in proficiency**
  - **Expert**
  - **Advanced**
  - **Intermediate**
  - **Basic**
  - **Awareness**

**Accurate Data Provides Accurate Gaps**



# Skill Gap Examples

- AFLCMC “Engineering Workforce” Data
- “Slice & Dice” in variety of useful ways
- Remove “opinion & conjecture” from the discussion



## Gap Analysis – Detailed (specific Technical Discipline)

Functional	Technical Discipline	Skill Level	Organization
EN	03.08.01 (EN) Cybersecurity and Resiliency Implementation	All	All

	Requirement Met	Gap (skill level)	Gap (vacant)	Gap (total)
<b>Current Requirements</b>	54 of 362 (15%)	49 of 362 (14%)	259 of 362 (72%)	308 of 362 (85%)
<b>Future Requirements</b>	48 of 367 (13%)	62 of 367 (17%)	257 of 367 (70%)	319 of 367 (87%)

Additional Employees with Skill Not Currently Required	
89	

## Gap Analysis – Summary (all Technical Disciplines)

Technical Discipline (Skill)	Total Requirement	Gap Summary		
	Positions Requiring Any Prof Level in this Skill	No Gap	Gap (skill level)	Gap (vacant)
	03.01.02 (EN) Development Systems Engineering	1064	402	186
03.01.03 (EN) Sustainment Systems Engineering	749	364	172	213
03.08.01 (EN) Cybersecurity and Resiliency Implementation	362	53	50	259
01.08.01 (EN) Avionics Integration	305	142	60	103
03.05.02 (EN) Configuration/ Data Management	288	111	43	134
03.01.01 (EN) Early Systems Engineering	264	122	85	57
03.02.01 (EN) Airworthiness	254	107	90	57
05.03.04 (EN) non-Embedded SW Engineering	254	35	53	166
02.01.08 (EN) Aircraft Structures Sustainment	207	97	46	64
03.03.01 (EN) Systems Engineering Assessments	204	74	57	73
05.03.01 (EN) Business and IT Enterprise Engineering	198	31	48	119
03.05.03 (EN) Engineering Data Management	177	72	45	60
01.02.01 (EN) Electronic Warfare Receivers	145	68	31	46
01.01.01 (EN) Radar	131	34	37	60
01.10.02 (EN) Embedded Computer Resources	126	56	22	48

Rqmnt	Expert			Advanced			
	No Gap	Gap (skill level)	Gap (vacant)	Rqmnt	No Gap	Gap (skill level)	Gap (vacant)
236	81	54	101	532	218	79	235
131	74	36	21	368	178	90	100
36	6	6	24	139	22	16	101
50	25	12	13	145	70	28	47
37	19	13	5	116	54	17	45
62	28	29	5	124	64	36	24
44	22	17	5	111	45	42	24
34	2	8	24	113	18	18	77
31	16	10	5	92	42	19	31
32	8	14	10	91	38	29	24
28	3	14	11	68	13	17	38
22	13	8	1	47	20	15	12
20	12	5	3	50	20	13	17
36	8	4	24	59	18	23	18
18	11	3	4	67	31	15	21



# Gaps Being Communicated to DoD Senior Leadership

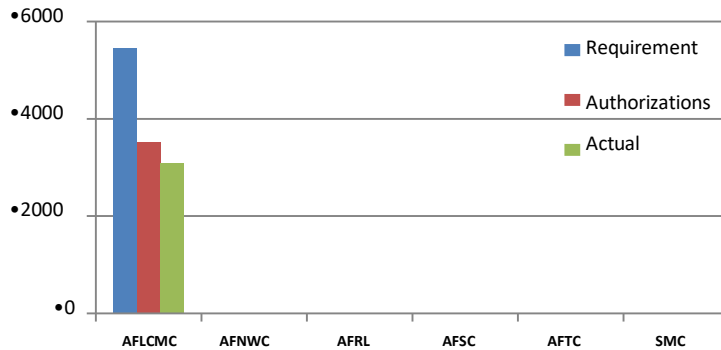
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- **17 Sep 2016 AFLCMC/EN-EZ Briefing (Dr. Ken Barker, SL, Sys Eng) to Secretary Kendall**
  - **AFLCMC Engineering Workforce Stats**
    - Current Requirement: 5459
    - Current Authorizations: 3523
    - Current Workforce: 3096
    - Gap:
      - 1935 authorizations
      - 2363 engineers
      - Specific skill gaps also conveyed
        - » All documented in the database



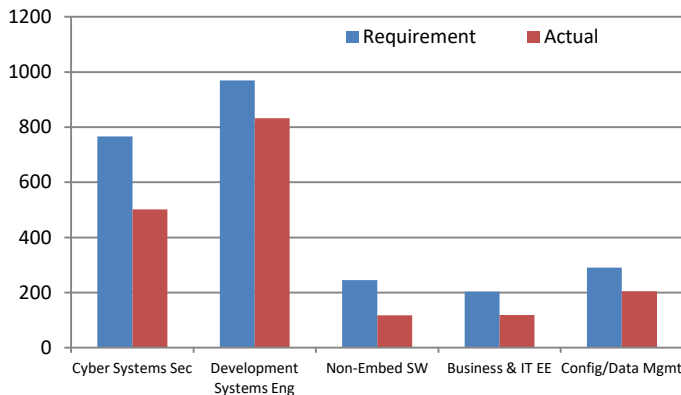
# AFLCMC Competency Data (24 Mar 16)

AF Total EN Workforce Gap



CENTER	GAP (Requirement -Actual)
AFLCMC	2363 (46.4%)
AFNWC	TBD
AFRL	TBD
AFSC	TBD
AFTC	TBD
SMC	TBD

AFLCMC's Top 5 Skill Gaps



Technical Discipline	GAP
System Security Engr (Cyber)	264 (34.5%) Nov 15
Development Systems Engr	137 (14.1%)
Non-Embedded Software	128 (52.2%)
Business & IT Enterprise Engr	85 (41.8%)
Config/Data Mgmt	85 (29.3%)

Data Feb 2016

**AFLCMC:**

- Taxonomy completed: 186 Technical Disciplines
- Requirements established: 5500 engineering positions w/skills
- Workforce assessed: 3100 engineers in-place against 3500 authorizations
- Gaps identified
- Expanding database to include Total Force (Military, A&AS, FFRDC)



# Gap Mitigations

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- **Fill vacancies**
  - Cannot fill all vacancies due to budget constraints
- **Submitting new work packages based on gap data**
  - Additional resources to close gaps are constrained by budget
- **Hiring support contractors with program dollars**
- **Allocating FFRDC SMEs accordingly**
- **Reach-Back**
  - Within PEO's portfolio (other program SMEs)
  - Outside PEO's portfolio (Engineering Home Office SMEs)
- **Training existing workforce in Tech Disciplines with gaps**
  - Requiring broader set of skills within our existing workforce





# Way Ahead

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- **Including Total Force**
  - Gov't Civilian: Done
  - Military, FFRDC, Support Contractors: In Work
- **Reporting Gaps in terms of Total Force**
  - “Owning the Technical Baseline”
- **Making Workforce-Related Decisions with Facts vice Opinions**



# Questions?

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Competency Management:  
Dr. Ken Barker, SL, Sys Eng  
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[kenneth.barker.3@us.af.mil](mailto:kenneth.barker.3@us.af.mil)

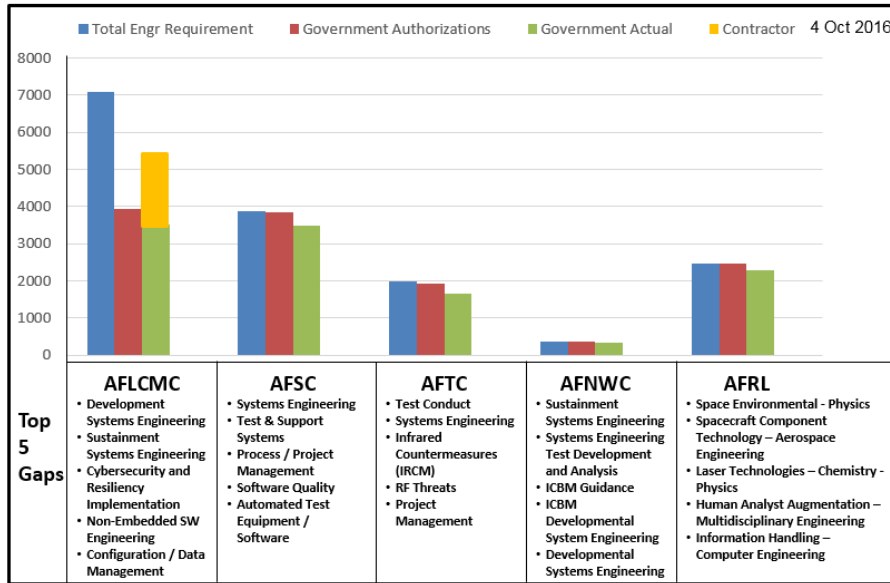
Competency Management  
Presenter:  
Andy Jeselson  
HQ AFMC/ENS  
(937) 257-6460  
[andrew.jeselson@us.af.mil](mailto:andrew.jeselson@us.af.mil)

Competency Management  
Sharepoint Site developer:  
Geoff Oliver  
AFLCMC/EZST  
(937) 656-7882  
[geoffrey.oliver.4@us.af.mil](mailto:geoffrey.oliver.4@us.af.mil)



# Metric: AFMC Engineering Workforce – Competency Gaps

## Baseline



## Discussion

- Competency Management establishes a skills-based organization with an agile, properly skilled workforce
- Competency Level metric quantifies gaps in workforce capabilities
  - Gap = Requirement – Assigned
  - Requirement = Civ + Mil + Ktr

## Causes/Issues

## Mitigation

- Center Requirements maturity levels vary
  - “Unconstrained” reqs call not complete
- AFTC identified additional critical gaps
  - Cyber and Propulsion
- AFNWC identified an additional critical gap
  - ICBM Nuclear Surety

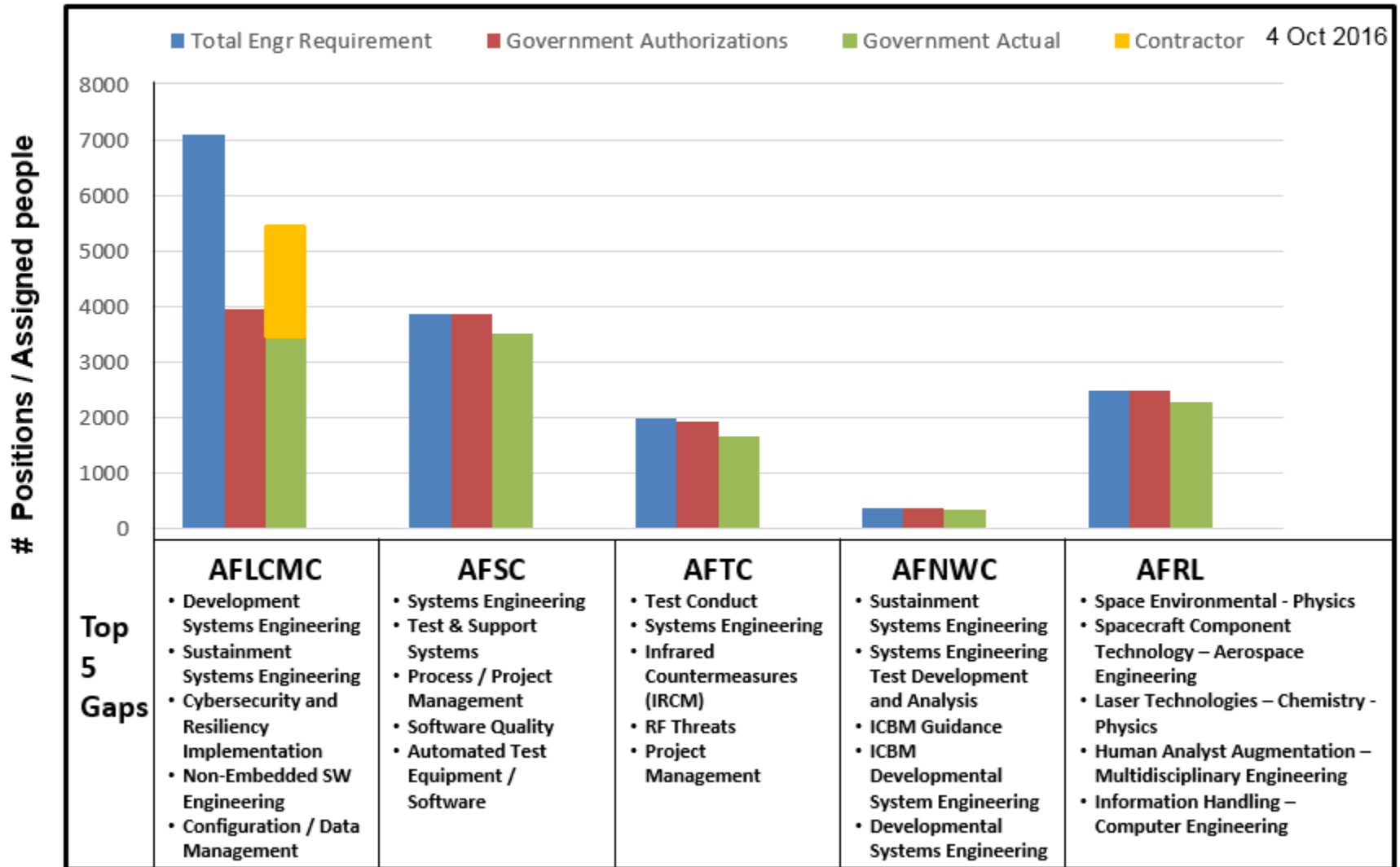
- Centers to take a holistic view on defining unconstrained Requirements
  - Helps justify increased Authorizations or additional Contractor support
- Ktrs alleviate some Assigned shortfall
  - Centers need competency reqs data for Ktr positions (FFRDC and A&AS)



# HQ AFMC METRIC

## AFMC Engineering Workforce–Competency Gaps

### Baseline

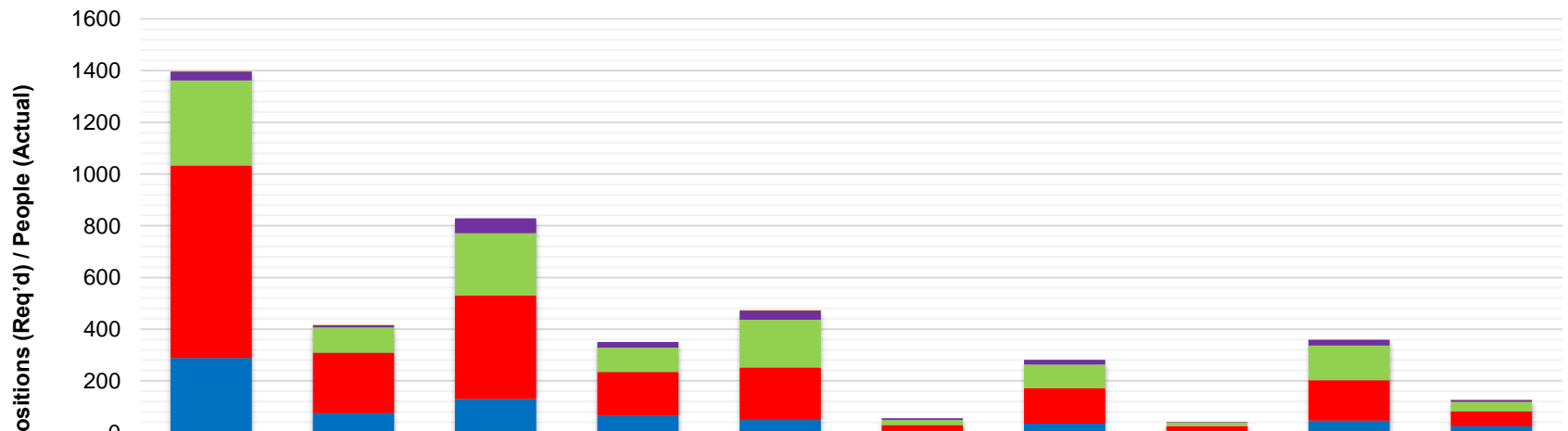




# Top 5 Gaps (AFLCMC)

## AFLCMC

### Top 5 Gaps



	Required	Actual	Required	Actual	Required	Actual	Required	Actual	Required	Actual
	03.01.02 (EN) Development Systems Engineering		03.01.03 (EN) Sustainment Systems Engineering		03.08.01 (EN) Cybersecurity and Resiliency Implementation		05.03.04 (EN) non- Embedded SW Engineering		03.05.02 (EN) Configuration/ Data Management	
1 - Awareness	1	1	0	0	2	0	0	0	2	2
2 - Basic	35	10	58	22	36	6	18	3	22	8
3 - Intermediate	329	97	241	94	184	20	92	14	135	36
4 - Advanced	745	234	400	170	203	23	136	22	156	58
5 - Expert	288	75	130	64	49	6	35	2	46	24

Technical Discipline