



Air Vehicle Design

AOE 4065 – 4066

Course Module P6

III. Project Management Elements

Delivering Effective Oral Presentations

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Overview of AVD Courses

I. Foundational Elements

- F1. Design: *An Engineering Discipline*
- F2. Systems and Systems Thinking
- F3. Basics of Systems Engineering
- F4. Decision Making with Ethics and Integrity

II. Air Vehicle Design Fundamentals

- A1. Purpose & Process
 - Conceptual Design**
- A2. Understand the Problem
- A3. Solve the Problem
- A4. Initial Sizing: *Takeoff Weight Estimation*
- A5. Initial Sizing: *Wing Loading and Thrust Loading Estimation*
- A6. Cost Considerations
- A7. Concept to Configuration: *Key Considerations*
- A7A. Configuration Layout: *Drawings & Loft*

Conceptual & Preliminary Design

- A8. Trade Studies
- A9. Use of Software Tools
- A10. Preliminary Design: *Baseline Design Refinement & Validation*

III. Project Management Topics

- P1. Basics of Project Management and Project Planning
- P2. Project Organization
- P3. Roles & Responsibilities of Team Members
- P4. Project Execution: *Teamwork for Success*
- P5. Project Risk Management
- P6. Delivering Effective Oral Presentations**
- P7. Writing Effective Design Reports

Disclaimer

*Prof. Pradeep Raj, Aerospace and Ocean Engineering, Virginia Tech,
collected and compiled the material contained herein from publicly
available sources solely for educational purposes.*

*Although a good-faith attempt is made to cite all sources of material,
we regret any inadvertent omissions.*

CRUCIALLY IMPORTANT

CMs only introduce key topics and highlight some important concepts and ideas...but without sufficient detail.

We must use lots of Reference Material* to add the necessary details!

(*see Appendix in the Overview CM)

P6. Delivering Effective Oral Presentations

P6.1 General Remarks

P6.2 Oral Project Reviews – Fall Semester (AOE 4065)

P6.2.1 “SRR” & “MPP Review”

P6.2.2 “SCR”

P6.2.3 “SDR”

P6.3 Oral Project Reviews – Spring Semester (AOE 4066)

P6.3.1 “iPDR”

P6.3.2 “PDR”

Oral Presentations

Team Design Project Reviews

Three Stages in the Life of All Presentations

1. Plan
2. Prepare
3. Deliver

IN THIS ORDER! Don't switch 1 and 2—PLEASE!

(Just like *Ready, Aim, Fire*: the right sequence)

Stage 1. Plan a Presentation

*Teams should **ask, answer, and discuss** the following types of questions:*

- ***Where do we start?***
 - ✓ Who is the audience?
 - ✓ What does the audience expect/want?
 - ✓ What is our end goal?
 - ✓ What is required to achieve the end goal?
 - ✓ What is (or ought to be) the principal thrust of our story?
- ***What are the constraints?***
 - ✓ When do we give the presentation?
 - ✓ How long will it last?
- ***How do we meet or exceed audience expectations?***
 - ✓ What is the best way to convey the story?
 - ✓ How do we make an impactful presentation?

Use Evaluation Criteria & Guidelines!

Learn About Your Audience

Before you start making slides, ask yourself the following questions about your **audience**:

- *Why are they there?*
- *Are they willing participants or mandatory attendees?*
- *What do you think they think they will get out of your presentation?*
- *What keeps them up at night?*
- *How does your effort benefit them?*
- *What's in it for them?*
- *...*

***It's NOT about what you want to tell.
It's all about what the audience needs/wants to hear.***

Stage 2. Prepare a Presentation

Teams must ask, answer and discuss the following type of questions:

- **What does it take to prepare an **engaging story** that resonates with the audience?**
 - ✓ How do we organize the story?
 - ✓ Have we prepared a “Storyboard?”
 - <https://procomm.ieee.org/using-a-storyboard-to-plan-a-presentation-2/>
 - What keywords/ phrases to include?
 - What figure(s), chart(s), table(s), or drawing(s) to include?
 - *You don't necessarily need the final figure/ chart/ table/ drawing at this stage!*
- **How to construct each slide?**
 - ✓ What is the slide caption?
 - ✓ What will the slide tell the audience?
 - ✓ What message do we want the audience to take away? Capture the message in a takeaway box (“*barf box*”) at the bottom!
 - ✓ Are caption and message compatible?
 - ✓ What needs to be added to the slide to substantiate the message?
 - ✓ Will the slides be simple and comprehensible?
 - ✓ *Are we focused on “what we did?” (activities) or “what we accomplished?”*

Stage 3. Deliver a Presentation

- **What to do**

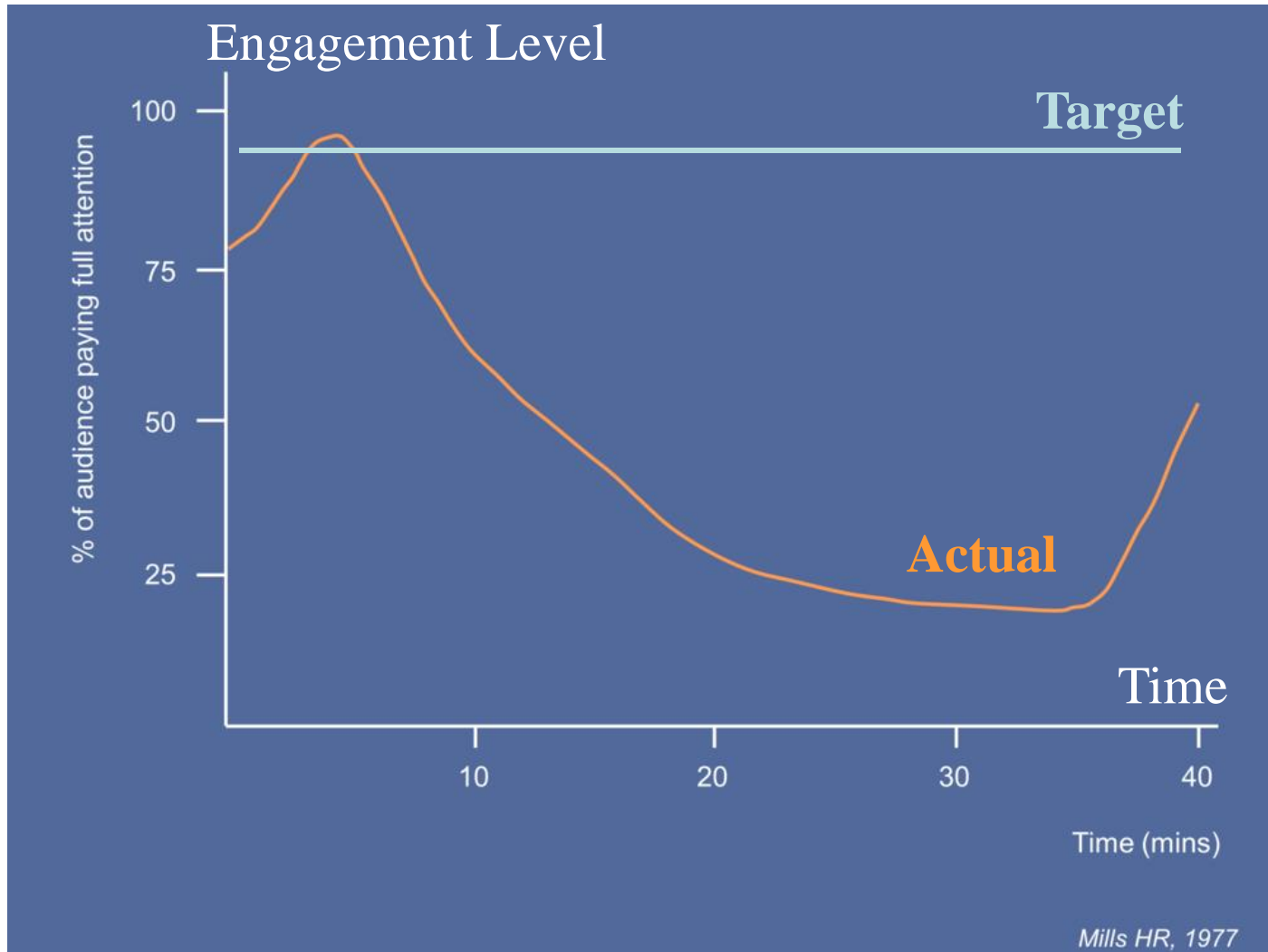
- Use an “optimum” number of slides (*Less is More!*)
- Balance words and figures on *each* slide; use big font (18 or more) for text
- ELABORATE content for the audience; don’t just read it or point to it
- Give the audience YOUR “message/ takeaway” for each slide
- Make [frequent] eye contact
- Keep your audience engaged with the presentation

- **What not to do**

- Do not race through the slides
- Do not just read a wordy slide
- Do not just point to the contents on the slide—and move on
- Do not leave the audience wondering “*what did I hear/ learn?*”
- Do not “lose” your audience
- Do not cause any distractions

Make it an Experience Worth Everyone’s Time and Effort!

Presentations: Your Challenge



- **Key to Success: Practice Practice Practice**

And Practice Some More to Keep the Audience Engaged!

P6. Delivering Effective Oral Presentations

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P6.3 Oral Project Reviews – Spring Semester (AOE 4066)

P6.3.1 “iPDR”

P6.3.2 “PDR”

Formal Design Project Reviews

AOE 4065 (Fall Semester)

- **Master Project Plan (“MPP”) Review** – *target 6th week*
- **System Requirements Review (“SRR”)** – *target 7th week*
- **System Concepts Review (“SCR”)** – *target 10th week*
- **System Design Review (“SDR”)** – *target 13th week*

Master Project Plan “MPP” Review

General Information

- **Purpose:** Convince the customer that your team has an effective plan to submit a responsive proposal on time and within budget.
- **When & Where:** At the previously scheduled weekly project review time and location.
- **Allotted Time:** **15 minutes** (uninterrupted) presentation time followed by **15 to 30 minutes of Q&A** and “**customer feedback.**” Total elapsed time **not to exceed 60 minutes.**
- **Content:** Define the content of your presentation slides using the “Evaluation Form” as a guide. For planning, preparing, and presenting your slides, use the “tips” in P7. Add figures and tables which will help you get your *message* across more effectively.

How do we get there from here!



“MPP”

Sample Evaluation Form

Date _____		Team _____											
CONFIDENTIAL When Filled Out		Evaluator _____											
		EVALUATOR ASSESSMENT (Choose a cell and mark with 'X')											
		a) Well thought out b) Strong grasp of subject matter c) Room for minor to small improvement			a) Gaps in thought process b) Limited grasp of subject matter c) Room for major to big improvement			a) Limited thought process b) No grasp of subject matter c) Room for <i>huge</i> improvement			Self explanatory		
Evaluation Criteria	Max. Points	Exceptional 0.95-1.0	Excellent 0.9-0.95	Very Good 0.85-0.9	Good 0.8-0.85	Above Avg. 0.75-0.8	Average 0.7-0.75	Below Avg. 0.6-0.7	Marginal 0.5-0.6	Poor 0.4-0.5	Very Poor 0.25-0.4	Dismal 0.0-0.25	Missing 0
1. Has the team identified <i>appropriate (i) tasks</i> using the WBS approach, and <i>(ii) major milestones</i> , such as key deliverables, task completions, etc. ?	10												
2. Did the team <i>properly schedule</i> all tasks? That is, clearly showed beginning and end dates, duration, and sequencing to accommodate any dependencies.	10												
3. Are the <i>Project Timeline</i> (EIS timeline) and <i>Project Plan</i> (Gantt chart) well suited for project success?	10												
4. Did the team present a <i>Team Organization Chart</i> and highlight the roles and responsibilities of all team members? Is the team organized for efficiently performing the project?	10												
5. Was the team successful in delivering an <i>engaging presentation</i> within the allocated time?	10												
TOTAL	50												
10/22/2023													

See Course Site: Files > Project Oral Reviews > MPP

Evaluation Criteria

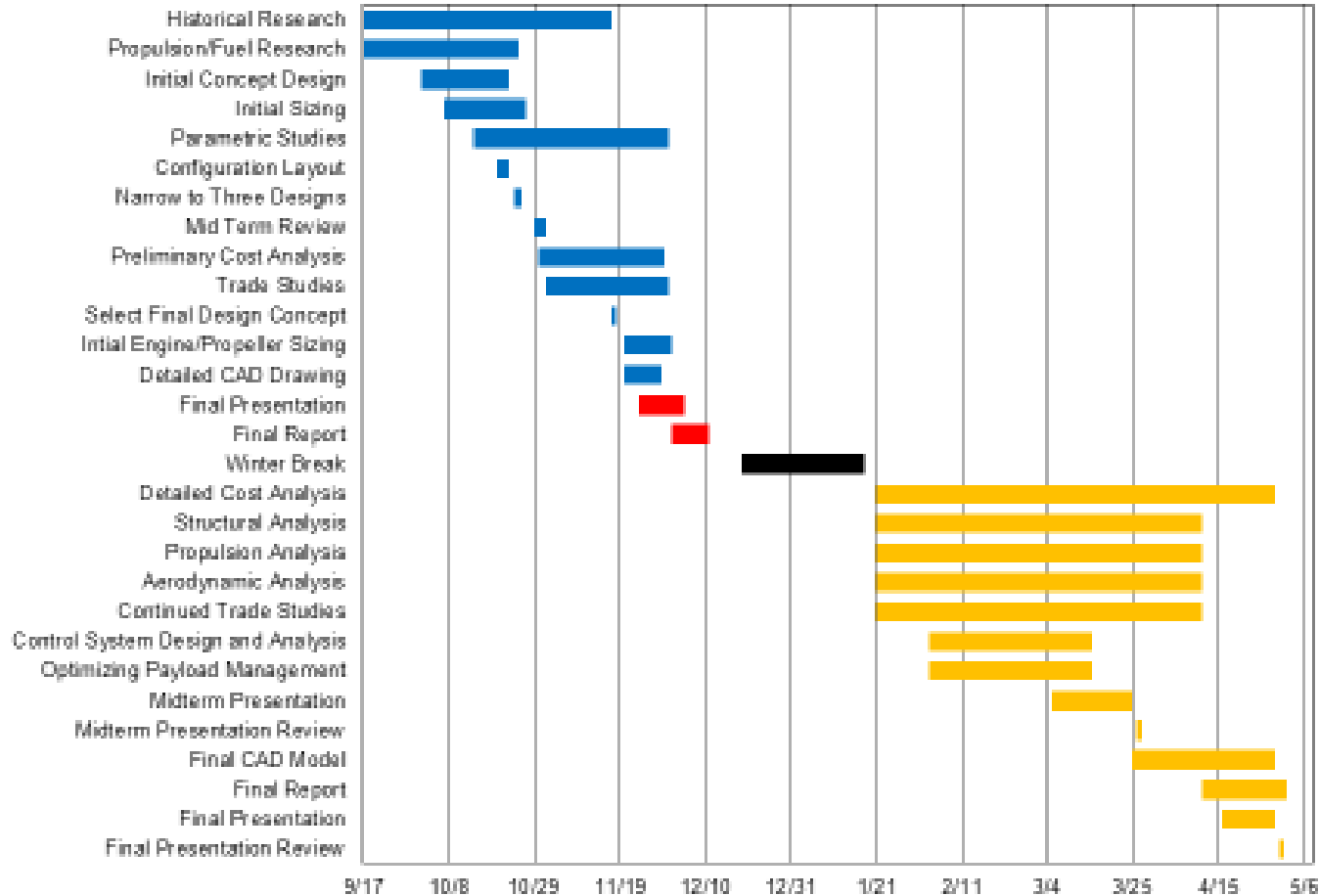
1. Has the team identified **appropriate (i) tasks** using the WBS approach, and **(ii) major milestones**, such as key deliverables, task completions, etc.?
2. Did the team **properly schedule** all tasks? That is, clearly showed beginning and end dates, duration, and sequencing to accommodate any dependencies.
3. Are the **Project Timeline** (EIS timeline) and **Project Plan** (Gantt chart) well suited for project success?
4. Did the team present a **team organization chart** and highlight the roles and responsibilities of all team members? Is the team organized for efficiently performing the project?
5. Was the team successful in **delivering an engaging presentation** within the allocated time?



"MPP" Example: Gantt Chart

2013-2014 VT NASA HALE Team Presentation

Project Schedule





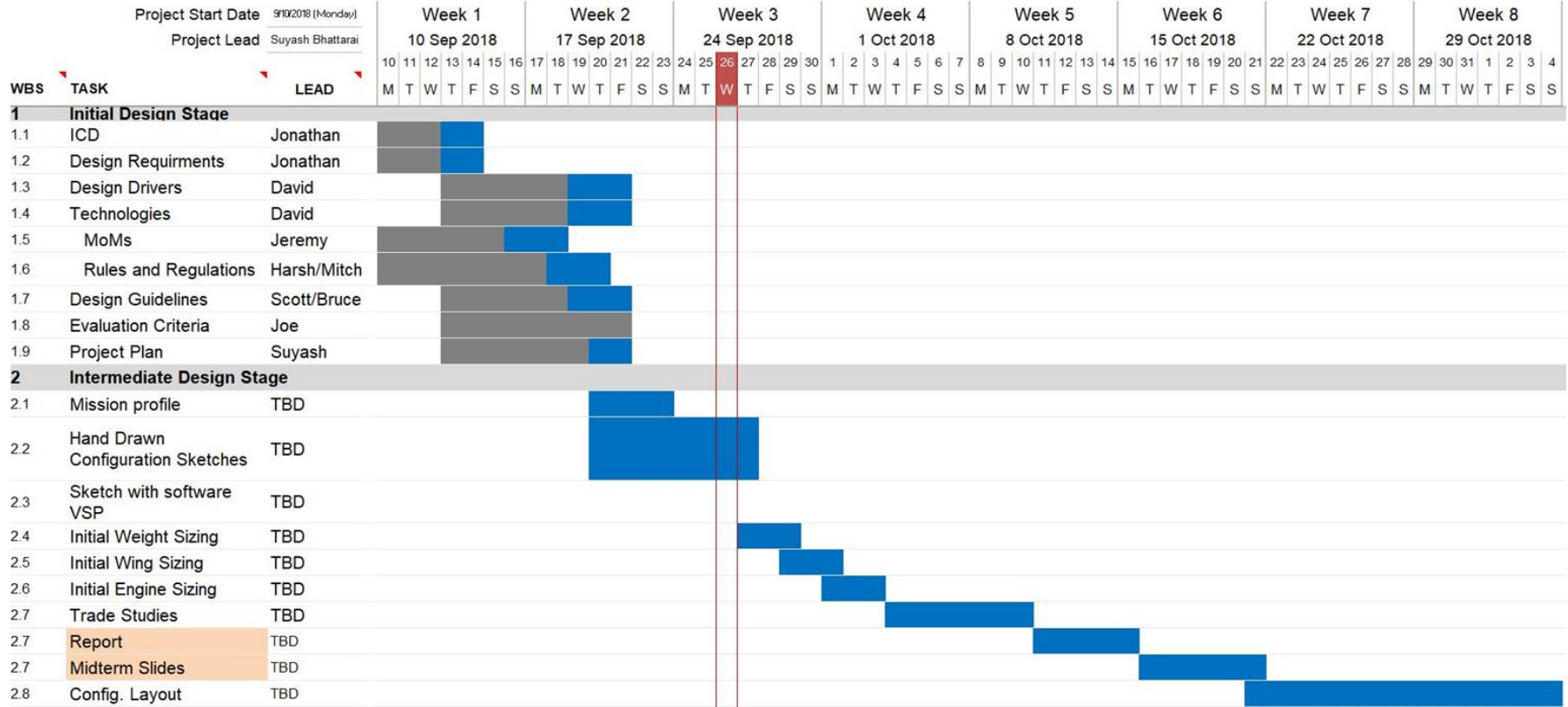
"MPP" Example: Gantt Chart

2018-2019 VT AfricAir Team Presentation

AfricAir

Senior Design Team

Gantt Chart Template © 2006-2018 by Vertex42.com.



Notice this

Only a snippet.

General Information

- Purpose: Convince the customer that your team’s *understanding of the problem* perfectly aligns with that of the customer.
- When & Where: At the time and location of your team’s **previously scheduled** weekly project reviews (**WPRs**).
- Allotted Time: **15 minutes** (uninterrupted) presentation time followed by **15 to 30 minutes of Q&A** and “**customer feedback.**” Total elapsed time **not to exceed 60 minutes.**
- Content: Define the content of your presentation slides using the “Evaluation Form” as a guide (next slide). For planning, preparing, and presenting your slides, use the “tips” in P7. Add figures and tables which might help you get your *message* across more effectively.



“SRR”

Sample Evaluation Form

Date _____ Team _____

CONFIDENTIAL When Filled Out

Evaluator _____

EVALUATOR ASSESSMENT (Choose a cell and enter a numerical value based on Evaluation Criteria)														
Evaluation Criteria	Max. Points	a) Well thought out b) Strong grasp of subject matter c) Room for minor to small improvement				a) Gaps in thought process b) limited grasp of subject matter c) Room for major to big improvement				a) Limited thought process b) No grasp of subject matter c) Room for <i>huge</i> improvement			Self explanatory	Points Earned
		Exceptional 0.95-1.0	Excellent 0.9-0.95	Very Good 0.85-0.9	Good 0.8-0.85	Above Avg. 0.75-0.8	Average 0.7-0.75	Below Avg. 0.6-0.7	Marginal 0.5-0.6	Poor 0.4-0.5	Very Poor 0.25-0.4	Dismal 0.0-0.25	Missing 0	
1. Did the team demonstrate a clear understanding of the <i>genesis of the problem</i> ?	10													
2. Did the team demonstrate a clear grasp of <i>initial operational capability</i> that the customer needs, and select a <i>good comparator aircraft</i> ?	10													
3. Did the team identify <i>all design requirements</i> as derived from various sources including RFP, FARs, MIL-SPECS, MIL-STDs, CONOPS, etc.?	10													
4. Did the team choose <i>appropriate measures of merits</i> with proper rationale?	10													
5. Did the team identify <i>key/dominant design drivers</i> with proper justification?	10													
6. Did the team identify <i>promising technologies</i> needed to tackle major design challenges for developing an <i>innovative</i> air vehicle system?	10													
7. Did the team demonstrate a clear understanding of customer's <i>proposal selection criteria</i> ?	10													
8. Did the team correctly define <i>design objectives</i> , develop an effective <i>design strategy</i> , and create a partially populated <i>Design Guidelines</i> document?	10													
9. Did the team prepare and present <i>quality slides</i> in terms of content, format, and appearance?	10													
10. Was the team successful in delivering an <i>engaging presentation</i> within the allocated time?	10													
TOTAL	100													

SAMPLE

See Course Site: Files > Project Oral Reviews > SRR

Evaluation Criteria

1. Did the team demonstrate a clear understanding of the *genesis of the problem*?
2. Did the team demonstrate a clear grasp of *initial operational capability* that the customer needs, and select a *good comparator aircraft*?
3. Did the team identify *all design requirements* as derived from various sources including RFP, FARs, MIL-SPECs, MIL-STDs, CONOPS, etc.?
4. Did the team choose *appropriate measures of merits* with proper rationale?
5. Did the team identify *key/dominant design drivers* with proper justification?
6. Did the team identify *promising technologies* needed to tackle major design challenges for developing an *innovative* air vehicle system?
7. Did the team demonstrate a clear understanding of customer's *proposal selection criteria*?
8. Did the team correctly define *design objectives*, develop an effective *design strategy*, and create a partially populated *Design Guidelines* document?
9. Did the team prepare and present *quality slides* in terms of content, format, and appearance??
10. Was the team successful in delivering an *engaging presentation* within the allocated time?

Approach to Meeting the Criteria

Analyze RFP (1 of 2)

- Why did the need arise? What gap does the system fill (**ICD**)?
- What is customer currently using to meet their need? Select a **Comparator** system
- What are the **Mission** Requirements?
 - **Crew:** Manned or unmanned
 - **Payload:** Passengers, cargo, weapons, sensors, ...
 - **Speed:** Cruise, maximum, loiter, landing, ...
 - **Distance:** Range or radius
 - **Duration:** Endurance or loiter (time on station)
 - **Field Length:** Short or conventional
 - **Environmental:** Noise, emissions
- What are the **Cost** Requirements?
 - Research, Development, Test & Evaluation (RDT&E)
 - Production
 - Engine and avionics
 - Acquisition
 - Operation & Support (O&S)
 - Direct Operating Cost + Insurance (**DOC+I**): Airlines
 - Life Cycle Cost (**LCC**): “Cradle to Grave”

Approach to Meeting the Criteria (contd.)

Analyze RFP (2 of 2)

- What are the **Reliability, Maintainability and Supportability (RM&S)** Requirements?
 - Maintenance man-hours per flight hour (MMH/FH)
 - Readiness levels; mean time between failure
 - Ground Support Equipment
 - Maintenance Levels
 - Integrated logistics support plan
 - Contractor- or user-provided support
- What are the **Scheduling** Requirements?
 - Entry into service
 - Development, test and certification
- Where did the requirements come from? Evaluate and **validate the Requirements**
- What **Specifications, Standards, and Regulations** are applicable and must be incorporated? May not be in the RFP!
 - Federal Aviation Regulations (FARs)
 - DOD Specifications and Standards (DODSS) System; MILSTD documents
- What are the **[Proposal] Selection Criteria and Data Deliverable requirements**

Develop “Design Objectives”

What is the customer expecting the team to accomplish?

- Many times, objectives are spelled out in the RFP (see example below)
- If not, teams need to define the objectives based on the analysis of the RFP

The design objective is to minimize the acquisition and operating cost. Advanced technologies should be used only where justified based on performance and cost (note entry into service date) and within acceptable cost and schedule risk.

2016-17 AIAA RFP

Design Objectives

- The re-use of at least 70% of the airframe structure and systems by weight for both the 6 and 8 seat variants is a design objective. This includes everything in the empty weight of the airplane with the exception of the engine.
- Minimize production cost by choosing materials and manufacturing methods appropriate for the production rate that is supported.
- Make the aircraft visually appealing so it will be marketable and identify what features are important to the pilot, passengers, and owners.
- Make the aircraft maintainable and reliability at least as good as comparable aircraft.

Develop “Design Strategy”

Design strategy defines how we will go about devising a winning solution to achieve the design objectives.

Example 1:

- ***What is the objective?*** minimize life cycle cost
- ***How would you go about meeting the objective?***
 - ***Analyze the situation and make a diagnosis:*** *What makes up life cycle cost, and what’s the biggest contributing factor?*
 - ***Determine actions:*** *How can we reduce the biggest contributing factor?*

Example 2:

- ***What is the objective?*** eliminate harmful emissions
- ***How would you go about meeting the objective?***
 - ***Analyze the situation and make a diagnosis:*** *What are the sources of harmful emissions? Which one is the biggest source?*
 - ***Determine actions:*** *How can we eliminate the biggest source of emissions?*

Strategy is a framework to guide everyone on the team to pull in the same direction.

Recommended Sources

- **Design Requirements**

- **Chapter 1, Section 1.3, Nicolai & Carichner (Ref. AVD 1)**
 - ✓ Mission, Cost, Maintenance & Support, Scheduling, etc.
 - ✓ Where do the requirements come from?
- **Chapter 1, Section 1.5, Nicolai & Carichner (Ref. AVD 1)**
 - ✓ Specifications, Standards, and Regulations
 - ✓ Derive requirements from relevant documents (e.g., FARs) for your problem

- **ConOps**

- **Module A2**
 - ✓ Add any requirements or design functions or features based on a careful assessment of end-user scenarios; see Supplementary Reference Material folder in the course site
- **ConOps is NOT synonymous with mission profile!**

- **Design Drivers**

- **Chapter 4, Moir & Seabridge (Ref. AS 1)**
 - ✓ Key Design Drivers—Essential for meeting the most important aspects of *customer needs*
- **Drivers are factors that influence design decisions**

Recommended Sources

- **Measures of Merit**

- **Chapter 1, Section 1.3.7, Nicolai & Carichner (Ref. AVD 1)**
 - Cost, DOC (Direct Operating Cost), Production Cost, or LCC (Life Cycle Cost)
 - RM&S (Reliability, Maintainability and Supportability)
 - Ride quality
- **Design teams use MoMs to *make decisions for configuration design and downselection!***

- **Promising Technologies**

- **Identify technologies that hold promise for tackling *your design challenges* in ways that would improve your chances of winning!**
- **Highly problem dependent; need to research multiple sources**

Design Guidelines

Civil Aircraft Example

- **Airworthiness**

- Range of xxx nm with full payload of yy lbs.
- Airframe and Engine(s) to meet all applicable FARs xx, yy, ...
- Capable of Cat II landing
- Flight operations to comply with applicable FARs xx, yy, ...
- Ice protection to be provided for engines, wing and stabilizer
- Cabin pressurization system to automatically control pressure at xx psi
- Aircraft shall function satisfactorily for ground ambient temperatures of -xx°F to +yyy°F
- ...

- **Accommodations**

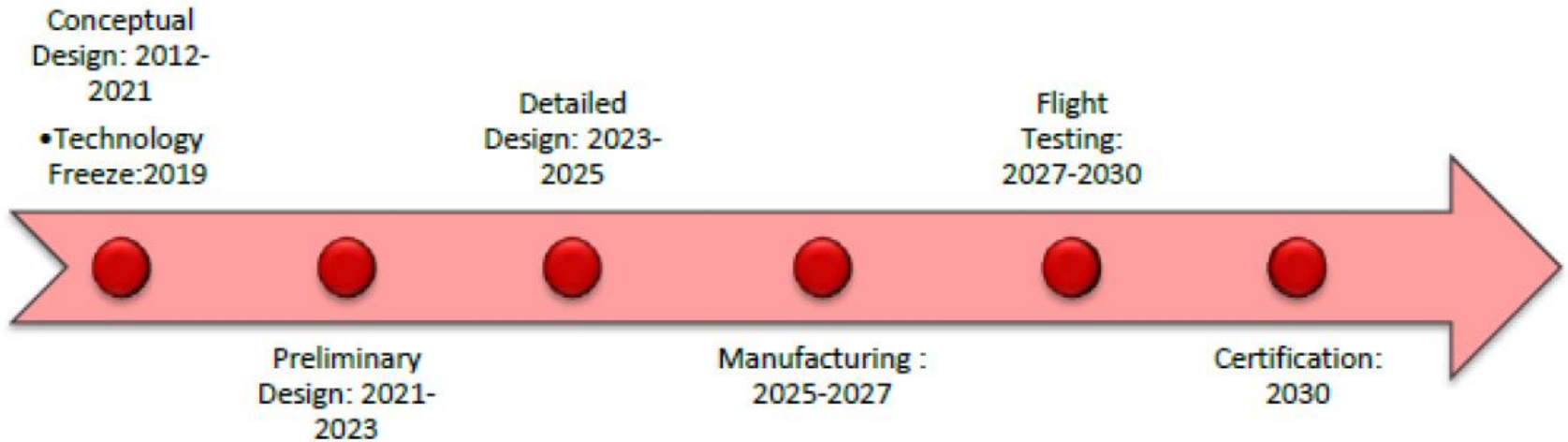
- Design shall allow different interior arrangements for passengers, crew and cargo
- ...
- **x% less cost and y% more fuel efficiency than comparator aircraft**
- **On and on for other areas such as performance, structures, etc.**

**Requirements
Flow Down**

A Living Document!

Project Timeline: *An Example*

Typically depicts major milestones from ATP (authorization to proceed) or go-ahead to EIS



Source: 2013 AIAA Undergrad Team Competition, Cal Poly, SLO, project report

“SRR” Format:

Suggestions for Making It More Impactful

- **Establish team “identity” by forming a “company” with a catchy “product” name.**
- **Title slide should have a date. Also, each slide should be sequentially numbered.**
- **Make sure to properly cite the source of every picture, table or plot that you didn’t create yourself. You thereby comply with both legal and ethical requirements.**
- **Report all engineering data in consistent units. If in doubt, pick the one customer used.**
- **Make sure to match captions to contents of each slide.**
- **It’s highly desirable to add takeaways at the bottom.**
- **The smallest font on a slide should [preferably] be Arial 18 pts.**

P6. Tips for Effective Oral Presentations

P6.1 General Remarks

P6.2 Oral Project Reviews – Fall Semester (AOE 4065)

P6.2.1 “SRR” & “MPP Review”

P6.2.2 “SCR”

P6.2.3 “SDR”

P6.3 Oral Project Reviews – Spring Semester (AOE 4066)

P6.3.1 “iPDR”

P6.3.2 “PDR”

“SCR” *General Information*

- **Purpose:** *To convince the “customer” that the team is making good progress and has a well-thought-out plan for the entire project.*
Therefore, focus your presentation on (i) understanding of the problem; (ii) progress to date; (iii) future plans including risks; and (iv) project management aspects.
- **When & Where:** On the previously scheduled day, time and location for your team.
- **Allotted Time:** **30 minutes** (uninterrupted) presentation time followed by **25 to 30 minutes of Q&A** and **“customer feedback.”** Target for total elapsed time is **60 minutes.**
- **Content:** Define the content of your presentation slides using the “Evaluation Form” as a guide. For planning, preparing, and presenting your slides, use the “tips” in PM 6. Add figures and tables which might help you get your *message* across more effectively.



System Concept Review (“SCR”): Sample Evaluation Form

Date _____ Team _____

CONFIDENTIAL When Filled Out

Evaluator _____

EVALUATOR ASSESSMENT (Choose a cell and enter a numerical value based on Evaluation Criteria)

Evaluation Criteria	Max. Points	a) Well thought out				a) Gaps in thought process				a) Limited thought process			Self explanatory	Points Earned
		Exceptional	Excellent	Very Good	Good	Above Avg.	Average	Below Avg.	Marginal	Poor	Very Poor	Dismal		
		0.95-1.0	0.9-0.95	0.85-0.9	0.8-0.85	0.75-0.8	0.7-0.75	0.6-0.7	0.5-0.6	0.4-0.5	0.25-0.4	0.0-0.25	Missing 0	
1. Understanding of the Problem	20													
a) Did the team demonstrate a good understanding of the <i>genesis of the problem</i> , <i>initial capability</i> , and <i>all design requirements</i> (mission, cost, schedule, etc.)?	5													
b) Did the team provide good justification for a <i>comparator aircraft</i> ; <i>ConOps</i> ; <i>key design drivers</i> , and <i>MoMs</i> ?	5													
c) Did the team identify <i>promising technologies</i> needed to tackle key design challenges, and demonstrate a clear understanding of customer's <i>proposal selection criteria</i> ?	5													
d) Did the team correctly define <i>design objectives</i> , develop a <i>design strategy</i> , and create a <i>Design Guidelines</i> document (at least partially populated)?	5													
2. Initial Set of Viable Concepts	20													
a) Did the team generate and present a meaningful <i>mission profile</i> and a reasonable set of <i>performance parameters</i> ?	5													
b) Did the team create a <i>diverse set of viable concepts</i> to meet customer's needs, and articulate <i>pros and cons</i> of each concept?	5													
c) Was the team able to provide good basis of justification for their <i>decision approach</i> to down-select most promising " <i>top three to four</i> " concepts?	5													
d) Did the team generate <i>quality sketches/ drawings</i> ?	5													
3. Initial Sizing (to assess feasibility)	20													
a) Did the team provide reasonable estimates of <i>TOGW</i> using <i>initial weight sizing</i> ?	5													
b) Did the team provide reasonable estimates of <i>wing loading</i> and <i>thrust (or power) loading</i> ?	5													
c) Did the team produce <i>constraint diagrams</i> to obtain a matched set of wing and thrust (power) loading?	5													
d) Did the team offer <i>complete answers</i> by conducting [limited] sensitivity studies and listing all assumptions or did they just stop at one set of values?	5													
4. Project Plan	10													
a) Did the team present a <i>team organization chart</i> and highlight the roles and responsibilities of all team members? Is the team organized for efficiently performing the project?	5													
b) Are the <i>project timeline</i> and <i>project plan</i> (with well-thought-out tasks, schedule, and milestones) well suited for project success?	5													
5. Future Plans	15													
a) Did the team define an approach for selecting <i>key project risks</i> and for <i>managing the highest risk items</i> ?	10													
b) Did the team define <i>criteria and process for selecting a PSC</i> from the set of feasible concepts?	5													
6. Other Factors	15													
a) Did the team prepare and present <i>quality slides</i> in terms of content, format, and appearance?	5													
b) Was the team successful in <i>delivering an engaging presentation within the allocated time</i> ?	10													
TOTAL	100													

SAMPLE

See Course Site: Files > Project Oral Reviews > SCR

System Concepts Review: “SCR”

Evaluation Criteria

1. Understanding of the Problem - 20%

- a) Did the team demonstrate a good understanding of the *genesis of the problem, initial capability*, and *all design requirements* (mission, cost, schedule, etc.)?
- b) Did the team provide good justification for a *comparator aircraft; key design drivers*, and *MoMs*?
- c) Did the team identify *promising technologies* needed to tackle key design challenges, and demonstrate a clear understanding of customer's *proposal selection criteria*?
- d) Did the team correctly define *design objectives*, develop *design strategy*, and create a partially populated *Design Guidelines* document?

2. Initial Set of Viable Concepts - 20%

- a) Did the team generate and present a meaningful *mission profile* and a reasonable set of *performance parameters*?
- b) Did the team create a *diverse set of viable concepts* to meet customer's needs, and articulate *pros and cons* of each concept?
- c) Was the team able to provide good basis of justification for their *decision approach* to down-select most promising "*top three to four*" concepts?
- d) Did the team generate *quality sketches/ drawings*?

Evaluation Criteria (contd.)

3. Initial Sizing (to assess feasibility) – 20%

- a) Did the team provide reasonable estimates of *TOGW* using *initial weight sizing*?
- b) Did the team provide reasonable estimates of *wing loading* and *thrust (or power) loading*?
- c) Did the team produce *constraint diagrams* to obtain a matched set of wing and thrust (power) loading?
- d) Did the team offer '*complete answers*' or just stopped at one set of values?

4. Project Plan – 10%

- a) Did the team present a team *organization chart* and highlight the roles and responsibilities of all team members? Is the team organized for efficiently performing the project?
- b) Are the *project timeline* and *project plan* (with well-thought-out tasks, schedule, and milestones) well suited for project success?

5. Future Plans – 15%

- a) Did the team define an approach for selecting *key project risks* and for *managing the highest risk items*?
- b) Did the team define *criteria and process for selecting a PSC* from the set of feasible concepts?



Evaluation Criteria (contd.)

6. Other Factors – 15%

- a) Did the team prepare and present *quality slides* in terms of content, format, and appearance?
- b) Was the team successful in *delivering an engaging presentation* within the allocated time?

“SCR” Content Organization

Preferable to **organize presentation slides to follow the Evaluation Form sequence.**

1. **Understanding of the Problem** – *Why, What, When, and Who*

- Your message: Yes, we understand your problem, and here is why.
- Substantiate the assertion: why the need; any comparators; Design requirements (mission, performance, regulations, cost, schedule, etc.); ConOps and derived requirements/features; MoMs; Design drivers; need for relevant technologies.
- Team should have studied the RFP like an attorney. *Read between the lines.*
- Wrap up with main design objectives, design strategy, and design guidelines

2. **Initial Set of Viable Concepts** – *How [we are solving the problem]*

- Your Message: We are committed to offering the best solution to your problem. We have created several innovative concepts that meet your needs. Here are a few (3 to 4) we have selected as they are most promising based on a set of selection criteria.

3. **Initial Sizing** (to assess feasibility) – *How*

- Your Message: Let's show you the estimated TOGW, wing and thrust (or power) loading for the selected concepts and why the results are believable.

4. **Project Plan**

- Your Message: We have organized the tasks and assigned responsibilities to the right people to make sure you get the best product “on time, on budget.”

5. **Future Plans** – *What and How*

- Your Message: We will perform additional quantitative and qualitative evaluations to select the best solution for you. (Note: Be as specific as possible.)

Substantiate
all assertions
(your messages)

Make it as easy as possible for the evaluator!

“SCR” Content Organization: *Recommendation*

- Develop an outline of the “story” first. Then create slides to tell the story!
- **Emphasize Accomplishments/ Achievements not just Activities**
 - Accomplishments/ Achievements: *What the important results/ findings are.*
 - Activities: *How you got the results! How you performed the tasks.*



DON'T CONFUSE ACTIVITY
WITH ACHIEVEMENT.



STANFORD
BUSINESS

System Concepts Review (“SCR”): *Guidelines (1 of 3)*

See the full document on the course site for the latest version.

The presentation should address the following questions and topics:

- Why the customer has this particular problem? What initial capability is desired?
What is the right comparator aircraft?
- What are the design requirements based on the information that the team has gathered about mission performance, regulations, cost, schedule, etc., etc.?
- Did the concept of operations (ConOps) add any design requirements or constraints?
- What are the measures of merit, key/dominant design drivers, and promising relevant technologies?
- What are the design objectives, team’s design strategy, and design guidelines?
- What is the mission profile and a reasonable set of performance parameters?
- What are the initial viable concepts? (Must have more than one!) Why do you think each concept can meet customer requirements? Highlight the approach used to arrive at the initial concepts. That is, what tradeoff studies were done to define the outer mold line (OML)? What are the pros & cons of each?

System Concepts Review (“SCR”): *Guidelines (2 of 3)*

- What are the current “top three to four” favorite concepts? Why? How were they chosen? Present these with good 3-view drawings. (Note--a preferred system concept will be selected from these, and will be presented at the final review at the end of the semester.)
- How did the team size the initial concepts, i.e., how did you estimate the initial values of take-off gross weight, wing loading, and thrust (or power) loading? Discuss your technical approach and the resulting *complete* answers. Show constraint plots and carpet plots to substantiate your choice of parameters. What tradeoff studies (mission, technology) did the team conduct?
- Going forward, how will the team select one single preferred system concept (PSC)? Describe the decision making process. That is, what kind of tradeoffs will the team conduct?
- What are the key project risks? How does the team plan to address them?
- How is the project organized and managed in terms of personnel and their roles and responsibilities?
- Does the team have a project plan in the form of a Gantt chart with tasks, schedule and milestones?

System Design Review “SCR”

Guidelines (3 of 3)

Specifications

1. We strongly encourage the team lead to make opening and closing remarks and every team member to participate in communicating the story. If the team decides to adopt a different approach, we want to understand the team’s rationale.
2. Limit your presentation to **30 minutes** and leave the rest of the time for questions and answers. ***You must adhere to the time limit.***
3. Deadline for uploading presentation slides (as an Adobe PDF file) to the shared folder of your team is **11:59 PM on the Sunday night before the week of the midterm SCR reviews unless advised differently.**
4. We will make hard copies for the evaluators. If you miss the deadline, be prepared to pay a 2.5% penalty if submitted the next day by 8 AM, or 5% if you wait till noon. After that, the team must bring six hardcopies to the presentation venue, and pay a 10% penalty.

***Your “Story” Should Effectively Communicate to the Audience:
“You offer the Best, Most Innovative solution to the problem.”***

“SCR” Format:

Suggestions to Improve Your Impact

- Establish **team “identity”** by forming a “**company**” with a catchy “**product**” name. “**Brand Recognition**” is a key ingredient of business success.
- **Title slide** should include project name, team name & number, System Concepts Review, and date.
- **Each slide** should be [sequentially] **numbered**.
- Properly **cite sources** of every picture, table or plot that you did not create yourself. You thereby comply with both legal and ethical requirements.
- Make sure **content matches caption** on each slide.
- It’s highly desirable to **add takeaways** at the bottom.
- The smallest font on a slide should [preferably] be **Arial 18 pts**.
- Report all **engineering data in consistent units**. If in doubt, pick the one that the customer used.
- Report engineering data with the correct **levels of accuracy and precision**.

P6. Tips for Effective Oral Presentations

P6.1 General Remarks

P6.2 Oral Project Reviews – Fall Semester (AOE 4065)

P6.2.1 “SRR” & “MPP Review”

P6.2.2 “SCR”

P6.2.3 “SDR”

P6.3 Oral Project Reviews – Spring Semester (AOE 4066)

P6.3.1 “iPDR”

P6.3.2 “PDR”

“SDR” *General Information*

- **Purpose:** For the customer to evaluate progress to date towards the development of an effective solution to be delivered at the end of the spring semester. Each team should present its **one** preferred system concept (PSC), and discuss the **entire** process used to select it from many potential candidates that could meet customer requirements.
- **When & Where:** On the scheduled day, time and location for your team.
- **Allotted Time:** Presentations should be 30 minutes long. *You must adhere to the time limit.* Plan for at least 30 minutes for feedback and questions & answers right after the presentation.
- **Content:** Define the content of your presentation slides using the “Evaluation Form” as a guide. For planning, preparing, and presenting your slides, use the “tips” in PM 6. Add figures and tables which might help you get your *message* across more effectively.



System Design Review (“SDR”): Sample Evaluation Form

Date _____		Team _____												
CONFIDENTIAL When Filled Out		Evaluator _____												
		EVALUATOR ASSESSMENT (Choose a cell and enter a numerical value based on Evaluation Criteria)												
		a) Well thought out b) Strong grasp of subject matter c) Room for minor to small improvement				a) Gaps in thought process b) Limited grasp of subject matter c) Room for major to big improvement				a) Limited thought process b) No grasp of subject matter c) Room for <i>huge</i> improvement				Self explanatory
Evaluation Criteria	Max. Points	Exceptional 0.95-1.0	Excellent 0.9-0.95	Very Good 0.85-0.9	Good 0.8-0.85	Above Avg. 0.75-0.8	Average 0.7-0.75	Below Avg. 0.6-0.7	Marginal 0.5-0.6	Poor 0.4-0.5	Very Poor 0.25-0.4	Dismal 0.0-0.25	Missing 0	Points Earned
1. Understanding of the Problem	20													
a) Did the team demonstrate a good understanding of the <i>genesis of the problem</i> , <i>initial capability</i> , and <i>all design requirements</i> (mission, cost, schedule, regulatory, RM&S, etc., etc.)?	5													
b) Did the team provide good justification for a <i>comparator aircraft</i> : <i>ConOps</i> and <i>any derived requirements</i> ; <i>key design drivers</i> , and <i>MoMs</i> ?	5													
c) Did the team identify <i>promising technologies</i> needed to tackle key design challenges, and demonstrate a clear understanding of customer's <i>proposal selection criteria</i> ?	5													
d) Did the team correctly define and present <i>design objectives</i> , <i>design strategy</i> , and share a sample of the contents of their <i>Design Guidelines</i> document?	5													
2. Proposed Solutions with Substantiation	50													
a) Did the team generate and present a <i>set of viable solutions</i> (system and/or vehicle concepts) for the design problem (Section 1 above)?	10													
b) Did the team present a set of <i>most promising</i> top three-to-four <i>feasible solutions</i> ? Did the team generate these feasible solutions by correctly choosing & using <i>appropriate methods</i> , such as, initial sizing, constraint diagram, carpet plots, trade studies, etc.? Did the team demonstrate good understanding of associated <i>assumptions</i> ?	10													
c) For selecting the preferred system concept (PSC), did the team <i>make decisions based on sound technical merit</i> supported by engineering analysis/ data/ results?	10													
d) Did the team present <i>compelling arguments</i> for their <i>PSC to be the 'best solution'</i> that offers great value to the customer? Were the arguments based on <i>credible evidence</i> that the team presented?	10													
e) Did the team clearly highlight <i>major project risks</i> and offered an <i>effective plan</i> to handle the risks to ensure successful completion of the project?	10													
3. Project Planning and Management	15													
a) Did the team present a <i>complete project plan</i> with well-thought-out tasks, schedule, and milestones covering work accomplished to date and remaining for the future? Did the plan convince you that the project can be successfully completed on time and on budget?	10													
b) Did the team present an <i>organization chart</i> and highlight the roles and responsibilities of all team members? Is the team organized for efficiently performing the project?	5													
4. Presentation	15													
a) Was the team <i>highly effective in communicating its "story"</i> ?	5													
b) Did the team convince you that their <i>PSC is the "best" most innovative solution</i> ?	10													
TOTAL	100													

SAMPLE

System Design Review: “SDR”

Evaluation Criteria

1. Understanding of the Problem

- a) Did the team demonstrate a good understanding of the *genesis of the problem, initial capability, and all design requirements* (mission, cost, schedule, etc.)?
- b) Did the team provide good justification for a *comparator aircraft; ConOps; key design drivers, and MoMs*?
- c) Did the team identify *promising technologies* needed to tackle key design challenges, and demonstrate a clear understanding of customer's *proposal selection criteria*?
- d) Did the team correctly define and present *design objectives, design strategy, and a Design Guidelines* document?

2. Proposed Solutions with Substantiation

- a) Did the team generate and present a *set of viable solutions* (system and/or vehicle concepts) to the design problem (Section 1 above)?
- b) Did the team present a set of *most promising* top three-to-four *feasible solutions*? Did the team generate these feasible solutions by correctly choosing & using *appropriate methods*, such as, initial sizing, constraint diagram, carpet plots, trade studies, etc.? Did the team demonstrate good understanding of associated *assumptions*?

System Design Review “SDR”

Evaluation Criteria (contd.)

- c) For selecting the preferred system concept (PSC), did the team *make decisions based on sound technical merit* supported by engineering analysis/ data/ results?
- d) Did the team present *compelling arguments* for their *PSC to be the 'best solution'* that offers great value to the customer? Were the arguments based on *credible evidence* that the team presented?
- e) Did the team clearly highlight *major project risks* and offered an *effective plan* to handle the risks to ensure successful completion of the project?

3. Project Planning and Management

- a) Did the team present a *complete project plan* with well-thought-out tasks, schedule, and milestones covering work accomplished to date and remaining for the future? Did the plan convince you that the project can be successfully completed on time and on budget?
- b) Did the team present a *team organization chart* and highlight the roles and responsibilities of all team members? Is the team organized for efficiently performing the project?

4. Presentation

- a) Was the team *highly effective in communicating its "story"*?
- b) Did the team convince you that their *PSC is the "best" most innovative* solution ?

System Design Review “SDR”

Key Considerations (1 of 3)

See the full document posted on the course site for the latest version.

- Presentation should focus on accomplishments (what the team achieved), not just its activities (what the team did). Beware that the two are not mutually exclusive but a focus on accomplishments will help the team present a compelling case to back up the assertion: *“we have developed the best design that meets all customer requirements.”*
- Use feedback from the previous reviews (SRR, MPP, SCR) to structure your SDR presentation. The presentation should tell a “story” of the entire project from its inception to the selection of the preferred concept, and include a realistic, convincing go-forward plan.

System Design Review “SDR”

Key Considerations (2 of 3)

- Consider building the story along the following lines:
 - I. Understanding of the Problem**—Discuss the team’s understanding of the problem including genesis of customer’s needs, all design requirements, ConOps, key design drivers, measures of merit, etc. etc. This should be based on a thorough and critical analysis of the RFP and other relevant material.
 - II. Proposed Solutions and Substantiating Technical Details**—Highlight your team’s process that covers creation of the initial viable concepts, downs election to a set of most promising feasible candidates, at least three if not more, that meet customer requirements. Show quality 3-view drawings of your designs annotated with dimensions, and key parameters such as *TOGW*, *W/S*, *T/W* or *P/W* (or *W/P*), etc. Present the PSC along with compelling arguments supporting your assertion that *it is the best solution to meet customer needs!* Discuss the team’s decision-making approach to selecting the PSC, and present engineering data and trade study results (carpet plots, constraint plots, etc.) to substantiate your conclusions. Identify major risks (events, if materialized, could severely hamper successful completion of the project) and highlight your approach to address them.
 - III. Project Planning and Management**—Show a project plan illustrating *major* tasks, schedule (start and end dates), *key* deliverables and milestones. Use a team organization chart to illustrate each team member’s roles and responsibilities.

System Design Review “SDR”

Key Considerations (3 of 3)

- We strongly recommend you carefully review each slide in your presentation to answer two questions: (i) why is the slide there? If the team cannot find a non-trivial answer, the slide is most likely of little value, and (ii) what message should the evaluator take away from the slide? Once the team determines the message, highlight it at the bottom of the slide.

Specifications

1. Presentations should not exceed 30 minutes; *the team must adhere to the time limit.* Right after the presentation, be prepared to answer questions from the ‘customer representatives’.
2. Deadline for uploading presentation slides (as an Adobe PDF file) to the shared folder of your team is ***11:59 PM on the Sunday night before the week of the midterm SCR reviews unless advised differently.*** If you miss the deadline, be prepared to pay a 2.5% penalty if submitted the next day by 8 AM, and 5% if by 11 AM. After that, you bring six hardcopies to the presentation venue and pay a 10% penalty.
3. We strongly encourage the team lead to make opening and closing remarks, and every team member to participate in communicating the story. If the team decides to adopt a different strategy, we want to understand the team’s rationale.

***Your “Story” Should Effectively Communicate to the Audience:
“You offer the Best, Most Innovative solution to the problem.”***

“SDR” Format:

Suggestions to Improve Your Impact

- Establish **team “identity”** by forming a “**company**” with a catchy “**product**” name. “**Brand Recognition**” is a key ingredient of business success.
- **Title slide** should include project name, team name & number, System Design Review, and date.
- **Each slide** should be [sequentially] **numbered**.
- Properly **cite sources** of every picture, table or plot that you did not create yourself. You thereby comply with both legal and ethical requirements.
- Make sure to **match captions to contents** of each slide.
- It’s highly desirable to **add takeaways** at the bottom.
- The smallest font on a slide should [preferably] be **Arial 18 pts**.
- Report all **engineering data in consistent units**. If in doubt, pick the one that the customer used.
- Report engineering data with the correct **levels of accuracy and precision**.

P6. Tips for Effective Oral Presentations

P6.1 General Remarks

P6.2 Oral Project Reviews – Fall Semester (AOE 4065)

P6.2.1 “SRR” & “MPP Review”

P6.2.2 “SCR”

P6.2.3 “SDR”

P6.3 Oral Project Reviews – Spring Semester (AOE 4066)

P6.3.1 “iPDR”

P6.3.2 “PDR”

Planned Project Reviews

AOE 4066 (Spring Semester)

- **Interim Preliminary Design Review (“iPDR”)** – *typically 7th week (the week before the Spring Break)*
- **Preliminary Design Review (“PDR”)** – *typically 15th week*

“iPDR” *General Information*

- **Purpose:** The main purpose of the iPDR is for the “customers” to evaluate each team’s approach, progress, and plans for maturing the preferred system concept (PSC) aka baseline design. Each team will give an oral presentation, and gather customer feedback for any course correction.
- **When & Where:** On the scheduled day, time and location for your team.
- **Allotted Time:** Presentations should be 30 minutes long. *You must adhere to the time limit.* Plan for at least 30 minutes for feedback and questions & answers right after the presentation.
- **Content:** Define/develop content of your presentation slides using the “Evaluation Form” as a guide. For planning, preparing, and presenting your slides, use the “tips” in P7. Add figures and tables which might help you get your *message* across more effectively.



Interim Preliminary Design Review

“iPDR” Sample Evaluation Form

Date _____ Team _____

CONFIDENTIAL When Filled Out

Evaluator _____

EVALUATOR ASSESSMENT (Choose a cell and enter a numerical value based on Evaluation Criteria)														
Evaluation Criteria	Max. Points	a) Well thought out b) Strong grasp of subject matter c) Room for minor to small improvement				a) Gaps in thought process b) Limited grasp of subject matter c) Room for major to big improvement				a) Limited thought process b) No grasp of subject matter c) Room for huge improvement			Self explanatory	Points Earned
		Exceptional 0.95-1.0	Excellent 0.9-0.95	Very Good 0.85-0.9	Good 0.8-0.85	Above Avg. 0.75-0.8	Average 0.7-0.75	Below Avg. 0.6-0.7	Marginal 0.5-0.6	Poor 0.4-0.5	Very Poor 0.25-0.4	Dismal 0.0-0.25	Missing 0	
1. Executive Summary	20													
a) Did the team clearly but concisely present a <i>summary of customer needs</i> ?	10													
b) Did the team clearly highlight <i>key aspects of the proposed solution</i> in terms of (i) meeting all requirements; and (ii) why their solution is the best?	10													
2. Proposed Solution with Substantiating Technical Details	50													
a) Did the team present a good <i>summary of the baseline design evolution</i> including the key elements of their <i>understanding of the problem</i> , and of their <i>approach</i> to developing a baseline solution (PSC)?	10													
b) For maturing the baseline (PSC) design, did the team clearly spell out specific requirements and progress to date <i>in each discipline area</i> ?	10													
c) Did the team provide key <i>substantiating engineering analysis/ data/ results</i> based on <i>sound technical merit</i> to substantiate results in each discipline area?	10													
d) Did the team present <i>compelling arguments</i> that their <i>refined PSC design remains the 'best solution'</i> that offers great value to the customer? Did the team provide adequate amount of <i>credible evidence</i> to substantiate their arguments?	10													
e) Did the team clearly highlight <i>major project risks</i> and offered an <i>effective plan to address them</i> to ensure project success?	10													
3. Project Planning and Management	15													
a) Did the team present a <i>complete plan for their project</i> with well-thought-out tasks, schedule, and milestones covering work accomplished to date and remaining for the future? Did the plan convince you that the project can be successfully completed on time and on budget?	10													
b) Did the team present a <i>team organization chart</i> and highlight the roles and responsibilities of all team members? Did the presentation convince you that the team is organized for efficiently performing the project?	5													
4. Presentation	15													
a) Was the team <i>highly effective in communicating its "story" using quality slides and clearly articulating the message of each slide</i> ?	5													
b) Did the team convince you that their <i>proposed solution is the "best" and most innovative</i> ?	10													
TOTAL	100													

SAMPLE



Interim Preliminary Design Review

iPDR Evaluation Criteria

1. Executive Summary

- a) Did the team clearly but concisely present a summary of customer needs?
- b) Did the team clearly highlight *key aspects of the proposed solution* in terms of (i) meeting all requirements; and (ii) why their solution is the best?

2. Proposed Solutions with Substantiating Technical Details

- a) Did the team present a good *summary of the baseline design evolution* including the key elements of their *understanding of the problem*, and of their *approach* to developing a baseline solution (PSC)?
- b) For maturing the baseline (PSC) design, did the team clearly spell out specific requirements and progress to date *in each discipline area*?
- c) Did the team provide key *substantiating engineering analysis/ data/ results* based on *sound technical merit* to substantiate results in each discipline area?
- d) Did the team present *compelling arguments* that their *refined PSC design remains the 'best solution'* that offers great value to the customer? Did the team provide adequate amount of *credible evidence* to substantiate their arguments?
- e) Did the team clearly highlight *major project risks* and offered an *effective plan to address them* to ensure project success?



Interim Preliminary Design Review

“iPDR” Evaluation Criteria (contd.)

3. Project Planning and Management

- a) Did the team present a *complete plan for their project* with well-thought-out tasks, schedule, and milestones covering work accomplished to date and remaining for the future? Did the plan convince you that the project can be successfully completed on time and on budget?
- b) Did the team present a *team organization chart* and highlight the roles and responsibilities of all team members? Did the presentation convince you that the team is organized for efficiently performing the project?

4. Presentation

- a) Was the team *highly effective in communicating its "story"* using *quality slides* and *clearly articulating the message of each slide*?
- b) Did the team convince you that their *proposed solution is the "best" and most innovative*?



Interim Preliminary Design Review

“iPDR” Key Considerations (1 of 3)

See the full document posted on the course site for the latest version.

1. Executive Summary—Your team should highlight

- i. key customer requirements (based on the team’s interpretation of the RFP);
- ii. key features of the proposed solution (use figures, charts, tables, three-view drawings, etc.);
- iii. compliance matrix (show whether or not your solution meets the design requirements); and
- iv. any other aspects you wish to discuss to convince the audience that your team’s offering is the BEST.

Note: Exec Summary is all about ‘what,’ not ‘how’ or ‘why.’ That is, it covers *what the overall problem is in a nutshell (not why); what your solution is (not how); and what differentiates your solution from those of other competitors.*

Please keep this part of the presentation to 10 minutes or less.

2. Proposed Solution and Substantiating Technical Details—Organize this part of the presentation in a way that allows you to tell an engaging story that most effectively substantiates your key message: “*our team offers the best design.*”

Place more emphasis on the progress made in refining the baseline design (PSC) created last semester, ***but you must summarize its evolution in order to provide a proper context.*** Items to consider in building your story include (not necessarily a comprehensive list!):

“iPDR” Key Considerations (2 of 3)

- i. Understanding of the Problem: genesis; all design requirements; comparators; key design driver(s), MoMs; technology considerations; design objectives; design strategy;
- ii. Design Evolution and Refinement: from viable to feasible to PSC (Baseline); mission profile for aircraft sizing; design space; ‘complete answers’; final OML; how and why of wing and airfoil parameters (AR , λ , t/c , etc.) selection; aircraft drag build up including trim drag; aircraft drag polar & moment characteristics; engine (or motor) selection; propulsion system integration; subsystems selection (avionics, landing gear, fuel systems, actuators, cabin systems, etc.); internal layout; weights and C.G.; empennage design including control surfaces (flaps, ailerons, elevators, rudder); stability & control characteristics; structural layout; V - n diagram; materials; vehicle performance validation; manufacturing; cost; etc., etc.
- iii. Substantiation: When discussing *Design Evolution and Refinement* above; justify your team’s decision-making rationale, and the choice of analysis, design and/or optimization methodology, trade studies, etc., used to generate the required data. Also, discuss project risks and your approach to address them.

“iPDR” Key Considerations (3 of 3)

3. Project Plan

- i. Show a project plan in the form of a Gantt chart with tasks, schedule (including start and end dates) and milestones. When discussing the chart, focus on the tasks that will be done in the six weeks following the interim review.
- ii. Show an organization chart with names of team members, and discuss their roles and responsibilities.

Specifications:

- a) Presentations should be 30 minutes long. *You must adhere to the time limit.* Plan for at least 30 minutes for feedback and questions & answers right after the presentation.
- b) All teams should upload their presentation slides (as an Adobe PDF file) to the shared Google Drive of your team by ***11:59 PM, the Sunday night before week of the midterm iPDR reviews.***

***Your “Story” Should Effectively Communicate to the Audience:
“You offer the Best, Most Innovative solution to the problem.”***

“iPDR” Format:

Suggestions to Improve Your Impact

- Title slide should include “**company**” name and logo, “**product**” name and a picture of your product, name of the competition, ‘Interim Preliminary Design Review’, and date.
- **Each slide** should be [sequentially] **numbered**.
- Properly **cite sources** of every picture, table or plot that you did not create yourself. You thereby comply with both legal and ethical requirements.
- Make sure to **match captions to contents** of each slide.
- It’s highly desirable to **add takeaways** at the bottom.
- The smallest font on a slide should [preferably] be **Arial 18 pts**.
- Report all **engineering data in consistent units**. If in doubt, pick the one that the customer used.
- Report engineering data with the correct **levels of accuracy and precision**.

P6. Tips for Effective Oral Presentations

P6.1 General Remarks

P6.2 Oral Project Reviews – Fall Semester (AOE 4065)

P6.2.1 “SRR” & “MPP Review”

P6.2.2 “SCR”

P6.2.3 “SDR”

P6.3 Oral Project Reviews – Spring Semester (AOE 4066)

P6.3.1 “iPDR”

P6.3.2 “PDR”

“PDR” *General Information*

- **Purpose:** The purpose of the final PDR is for the “customers” to evaluate each team’s comprehensive response to the request for proposal (RFP). *The presentation must cover the entire project from RFP release to project completion through April.*
- **When & Where:** On the scheduled day, time and location for your team.
- **Allotted Time:** Presentations should be 30 minutes long. *You must adhere to the time limit.* Plan for at least 30 minutes for feedback and questions & answers right after the presentation.
- **Content:** Define/develop content of your presentation slides using the “Evaluation Form” as a guide. For planning, preparing, and presenting your slides, use the “tips” in Module P7. Add figures and tables which might help you get your *message* across more effectively.



Preliminary Design Review

"PDR" Sample Evaluation Form

Date _____ Team _____

CONFIDENTIAL When Filled Out

Evaluator _____

EVALUATOR ASSESSMENT (Choose a cell and enter a numerical value based on Evaluation Criteria)														
Evaluation Criteria	Max. Points	a) Well thought out b) Strong grasp of subject matter c) Room for minor to small improvement				a) Gaps in thought process b) Limited grasp of subject matter c) Room for major to big improvement				a) Limited thought process b) No grasp of subject matter c) Room for huge improvement			Self explanatory	Points Earned
		Exceptional 0.95-1.0	Excellent 0.9-0.95	Very Good 0.85-0.9	Good 0.8-0.85	Above Avg. 0.75-0.8	Average 0.7-0.75	Below Avg. 0.6-0.7	Marginal 0.5-0.6	Poor 0.4-0.5	Very Poor 0.25-0.4	Dismal 0.0-	Missing 0	
1. Executive Summary	20													
a) Did the team clearly but concisely present a <i>summary of customer needs</i> ?	10													
b) Did the team clearly highlight <i>key aspects of the proposed solution</i> in terms of (i) meeting all requirements; and (ii) why their solution is the best?	10													
2. Proposed Solution with Substantiating Technical Details	50													
a) Did the team present a <i>good summary of their baseline (PSC) design evolution</i> including the key elements of their <i>understanding of the problem</i> , and of their <i>approach</i> to developing a baseline solution (PSC)?	10													
b) For maturing the baseline (PSC) design, did the team clearly spell out specific objectives, requirements and progress to date <i>in each discipline area</i> ?	10													
c) Did the team provide key <i>substantiating engineering analysis/ data/ results</i> based on <i>sound technical merit</i> to substantiate results in each discipline area?	10													
d) Did the team present <i>compelling arguments</i> that their refined <i>PSC design remains the 'best solution'</i> that offers great value to the customer? Did the team provide adequate amount of <i>credible evidence</i> to substantiate their arguments?	10													
e) Did the team clearly highlight <i>major project risks</i> and offered an <i>effective plan</i> to address the risks to ensure project success?	10													
3. Project Planning and Management	15													
a) Did the team present a <i>complete plan of their project</i> with well-thought-out tasks, schedule, and milestones covering work accomplished?	10													
b) Did the team present a <i>team organization chart</i> and highlight the roles and responsibilities of all team members? Did the presentation convince you that the team was organized for efficiently performing the project?	5													
4. Presentation	15													
a) Was the team <i>highly effective in communicating its 'story'</i> using <i>quality slides and clearly articulating the message of each slide</i> ?	5													
b) Did the team convince you that their <i>proposed solution is the "best" and most innovative</i> ?	10													
TOTAL	100													

SAMPLE

Preliminary Design Review

PDR Evaluation Criteria

1. Executive Summary

- a) Did the team clearly but concisely present a summary of *customer needs*?
- b) Did the team clearly highlight key aspects of the proposed solution in terms of (i) meeting all requirements; and (ii) why their solution is the best?

2. Proposed Solutions with Substantiating Technical Details

- a) Did the team present a *good summary of their baseline (PSC) design evolution* including the key elements of their *understanding of the problem*, and *approach* to developing a baseline solution (or PSC)?
- b) For maturing the baseline (PSC) design, did the team clearly spell out specific objectives, requirements and progress to date in *each discipline area*?
- c) Did the team provide *key substantiating engineering analysis/ data/ results* based on *sound technical merit* to substantiate assertions in each discipline area?
- d) Did the team present *compelling arguments* that their *PSC design remains the 'best solution'* that offers great value to the customer? Did the team provide adequate amount of *credible evidence* to substantiate their arguments?
- e) Did the team clearly highlight *major project risks* and offered an *effective plan* to address the risks to ensure project success?

Preliminary Design Review

“PDR” Evaluation Criteria (contd.)

3. Project Planning and Management

- a) Did the team present a *complete plan of their project* with well-thought-out tasks, schedule, and milestones covering work accomplished to date?
- b) Did the team present a *team organization chart* and highlight the roles and responsibilities of all team members? Did the presentation convince you that the team was organized for efficiently performing the project?

4. Presentation

- a) Was the team *highly effective in communicating its "story"* using *quality slides* and *clearly articulating the message of each slide*?
- b) Did the team convince you that their *proposed solution is the "best" and most innovative*?

Preliminary Design Review

“PDR” Key Considerations (1 of 3)

See the full document posted on the course site for the latest version.

1. Executive Summary—Your team should highlight

- i. key customer requirements (based on the team’s interpretation of the RFP);
- ii. key features of the proposed solution (use figures, charts, tables, three-view drawings, etc.);
- iii. compliance matrix (show whether or not your solution meets the design requirements); and
- iv. any other aspects you wish to discuss to convince the audience that your team’s offering is the BEST.

Note: Exec Summary is all about ‘what,’ not ‘how’ or ‘why.’ That is, it covers *what the overall problem is in a nutshell (not why); what your solution is (not how); and what differentiates your solution from those of other competitors.*

Please keep this part of the presentation to 10 minutes or less.

2. Proposed Solution and Substantiating Technical Details—Organize this part of the presentation in a way that allows you to tell an engaging story that most effectively substantiates your key message: “*our team offers the best design.*”

Place more emphasis on the progress made in refining the baseline design (PSC) created last semester, ***but you must summarize its evolution in order to provide a proper context.*** Items to consider in building your story include (not necessarily a comprehensive list!):

Preliminary Design Review

“PDR” Key Considerations (2 of 3)

- i. Understanding of the Problem: genesis; all design requirements; comparators; key design driver(s), MoMs; technology considerations; design objectives; design strategy;
- ii. Design Evolution and Refinement: from viable to feasible to PSC; mission profile for aircraft sizing; design space; ‘complete answers’; final OML; how and why of wing and airfoil parameters (AR , λ , t/c , etc.) selection; aircraft drag build up including trim drag; aircraft drag polar & moment characteristics; engine (or motor) selection; propulsion system integration; subsystems selection (avionics, landing gear, fuel systems, actuators, cabin systems, etc.); internal layout; weights and C.G.; empennage design including control surfaces (flaps, ailerons, elevators, rudder); stability & control characteristics; structural layout; V - n diagram; materials; vehicle performance validation; manufacturing; cost; etc., etc.
- iii. Substantiation: When discussing *Design Evolution and Refinement* above; justify your team’s decision-making rationale, and the choice of analysis, design and/or optimization methodology, trade studies, etc., used to generate the required data. Also, discuss project risks and your approach to address them.

Preliminary Design Review

“PDR” Key Considerations (3 of 3)

3. Project Plan

- i. Show a project plan in the form of a Gantt chart with tasks, schedule (including start and end dates) and milestones.
- ii. Show an organization chart with names of team members, and discuss their roles and responsibilities.

Specifications:

- a) Presentations should be 30 minutes long. *You must adhere to the time limit.* Plan for at least 30 minutes for feedback and questions & answers right after the presentation.
- b) All teams should upload their presentation slides (as an Adobe PDF file) to the shared Google Drive of your team by ***11:59 PM, the Sunday night before week of the midterm PDR reviews.***

***Your “Story” Should Effectively Communicate to the Audience:
“You offer the Best, Most Innovative solution to the problem.”***

“PDR” Format:

Suggestions to Improve Your Impact

- Title slide should include “**company**” name and logo, “**product**” name and a picture of your product, name of the competition, ‘Preliminary Design Review’, and date.
- **Each slide** should be [sequentially] **numbered**.
- Properly **cite sources** of every picture, table or plot that you did not create yourself. You thereby comply with both legal and ethical requirements.
- Make sure to **match captions to contents** of each slide.
- It’s highly desirable to **add takeaways** at the bottom.
- The smallest font on a slide should [preferably] be **Arial 18 pts**.
- Report all **engineering data in consistent units**. If in doubt, pick the one that the customer used.
- Report engineering data with the correct **levels of accuracy and precision**.