

PROFESSIONAL ENGINEERING MANAGEMENT

- **BOB GURA**
- **ELECTRICAL ENGINEER DEGREED AT
CWRU**
- **DESIGN EXPERIENCE: 40 YEARS
AEROSPACE AND MEDICAL ELECTRONICS**
- **DEPT HEAD OF A MULTIDISPLINED
ENGINEERING GROUP (EE'S, ME'S, S/W,
SYSTEMS, MATERIALS)**

- **HARDWARE DESIGN EXPERIENCE;
ELECTROMECHANICAL PRECISION
SERVO'S FOR AIRCRAFT AND WEAPON
GUIDANCE SYSTEMS**
- **PEOPLE MANAGEMENT & LEADERSHIP;
TECHNICAL CUSTOMER CONTACT,
MARKETING INPUT & PROJECT
MANAGEMENT OF MULTIMILLION
DOLLAR DEVELOPMENT PROGRAMS**

PROFESSIONAL ENGINEERING MANAGEMENT

- **MUCH HAS BEEN STUDIED AND WRITTEN**
- **IMPACT YOUR CARREER**
- **CORNERSTONE PRINCIPLES:**
 - **PLANNING & EXECUTION METHODS**
 - **COMMUNICATION TECHNIQUES**
 - **MANAGEMENT ORGANAZATIONS**
 - **TEAMWORK**

PROFESSIONAL MANAGEMENT

- **WHAT IS PROJECT MANAGEMENT?**
- **PRINCIPLES, PROCEDURES & ACTIVITIES DESIGNED BY INDUSTRY MANAGEMENT TO INSURE PROJECT SUCCESS**
- **PEOPLE ARE FUNDAMENTAL TO SUCCESS**
- **PEOPLE ARE ALL DIFFERENT IN PERSONALITY, KNOWLEDGE, ABILITY & MOTIVATION**

TEAMWORK

- **TEAMS ARE ESTABLISHED TO BLEND THESE DIFFERENCES INTO AN EFFICIENT UNIT**
- **THE ABILITY TO FUNCTION EFFICIENTLY FOR THE BENEFIT OF THE TASK AT HAND IS CALLED TEAMWORK**
- **FUNCTIONAL TEAMWORK IS ESSENTIAL TO SUCCESSFUL PROJECT WORK**

TEAMWORK

EXAMPLES OF TEAMS

SPORTS

MILITARY

MEDICAL

TECHNICAL

TEAMWORK

WHAT IS COMMON TO ALL TEAMS?

✌️ TASK ORIENTATION

SCORE THE MOST POINTS

COMPLETE THE MISSION

SAVE A LIFE

COMPLETE A TECH PROJECT

TEAMWORK

DEPENDENCY ON ONE ANOTHER

- EACH FOOTBALL PLAYER HAS A JOB INTERRELATED TO ANOTHER
- EACH SOLDIER HAS A DEPENDENCY ON HIS BUDDY TO PROTECT HIS FLANK
- EACH PROJECT TEAM MEMBER DEPENDS ON ANOTHER TO PERFORM HIS/HER ROLE
- TRUST IS A MAJOR COMPONENT

TEAMWORK

C. DIVERSE MAKEUPS

**WITH MULTIPLE ABILITIES AND
DIFFERING MENTAL OUTLOOKS
(PERSONALITIES & MOTIVATION)**

TEAMWORK

A TEAM IS NOT

- ❑ A GROUP THAT WORKS IN THE SAME PLACE
- ❑ A GROUP WORKING FOR THE SAME PERSON
- ❑ A GROUP THAT DOES THE SAME JOB

TEAMWORK

A TEAM IS

- ❑ A GROUP SHARING A COMMON ASSIGNMENT
- ❑ A GROUP THAT DEPENDS ON EACH PERSON'S UNIQUE INPUT
- ❑ A GROUP COMMITTED TO ACHIEVING MAXIMUM RESULTS WITH A SET OF SPECIFIC RESTRAINTS

TEAMWORK

**THE FUNDAMENTAL REASON FOR A
TEAM'S EXISTENCE IS TO ACHIEVE
SPECIFIC GOAL USING VARIETY OF
PERSONAL CAPABILITIES**

TEAMWORK - CHARACTERISTICS

ALL TEAMS SHARE CERTAIN
CHARACTERISTICS

A FOCUS ON :

WHAT IS THE TASK

HOW LONG TO DO IT

WHAT IS THE APPROACH

TEAMWORK - CHARACTERISTICS

STRONG SENSE OF LEADERSHIP

- o TO CLARIFY GOALS**
- o TO POSITION THE PROPER ASSETS**
- o TO POSITION THE APPROPRIATE PEOPLE**

TEAMWORK - CHARACTERISTICS

**MATCH CAPABILITIES TO
APPROPRIATE TASKS:
CREATE AN EFFICIENT UNIT**

**PROVIDE CLEAR & EFFECTIVE
COMMUNICATION:**

LANGUAGE IS EASILY MISINTERPRETED

**- SAY WHAT YOU MEAN AND MEAN WHAT
YOU SAY -**

TEAMWORK - CHARACTERISTICS

TRUST – EXTREMELY IMPORTANT:

OPENNESS TO NEW IDEAS

HARD TO DO, BUT NECESSARY

TEAMWORK - CHARACTERISTICS

ABILITY TO DEAL WITH CONFLICT:

**PEOPLE REACT DIFFERENTLY TO
EACH OTHER, TO STRESS, & TO
MOTIVATION**

ABILITY TO BALANCE:

**INNOVATION, QUALITY, SPEED OF
COMPLETION, & COST EFFECTIVITY**

TEAMWORK - CHARACTERISTICS

**TEAM MEMBERS MUST BE ABLE
TO BLEND TALENTS,
PERSONALITIES &
CAPABILITIES**

TEAMWORK - PSYCHOLOGY

- **HEAVILY DEPENDENT ON PERSONAL INTERACTION**
- **TRUST IS A DRIVER**
- **LEADERSHIP IS EARNED THROUGH TRUST**
- **TEAM MEMBERS BLEND IN STRENGTH WITHOUT PETTY JEALOUSLY OR EGO BUILDING**

TEAMWORK - PSYCHOLOGY

THE RESULT OF EFFECTIVE

TEAMWORK IS THAT THE NET

OUTPUT IS GREATER THAN

THE SUM OF THE TEAM'S PARTS

TEAMWORK – DEVELOPMENT STAGES

FOUR PRIMARY STAGES:

 FORMING

 STORMING

 NORMING

 PERFORMING

 POSSIBLE FIFTH - ADJOURNING

TEAMWORK - DEVELOPMENT STAGES

1. FORMING

- a) GROUP COMES TOGETHER**
- b) EVERYONE IS POLITE**
- c) CONFLICT IS NOT DIRECT**
- d) OPINIONS ARE GUARDED & RESERVED**
- e) NERVOUS OR SUBORDINATE
INDIVIDUALS MAY NEVER RECOVER**
- f) GROUP DEFERS TO EMERGING LEADER**

TEAMWORK – DEVELOPMENT STAGES

2. STORMING

- a) PROBLEMS DEVELOP & LEADER IS LYNCHED**
- b) PERSONALITIES CLASH**
- c) POINTS ARE NOT CONCEDED WITHOUT FIGHT**
- d) LITTLE COMMUNICATION OCCURS**
- e) NO ONE LISTENS & SOME WON'T TALK**
- f) BENEATH THE SURFACE PICTURE STARTS TO COME INTO FOCUS**

TEAMWORK – DEVELOPMENT STAGES

3. NORMING

- a) SUBGROUPS RECOGNIZE NEED TO WORK TOGETHER
- b) IN FIGHTING SUBSIDES
- c) SPIRIT OF CO-OPERATION BEGINS & ALL START TO EXPRESS VIEWPOINTS
- d) PEOPLE START TO LISTEN TO EACH OTHER
- e) WORK METHODS ARE ESTABLISHED AND RECOGNIZED BY THE ENTIRE GROUP

TEAMWORK – DEVELOPMENT STAGES

4. PERFORMING

a) **GROUP SETTLES ON A SYSTEMATIC APPROACH**

∞ **FREE & FRANK EXCHANGE TAKES PLACE**

∞ **HIGH DEGREE OF SUPPORT FOR EACH OTHER AND FOR THE GROUP'S DECISIONS TO TAKE PLACE**

TEAMWORK – DEVELOPMENT STAGES

5. ADJOURNING

- a) **DISBAND - FEELING OF SUCCESS & SATISFACTION**
- b) **AGREE RESULTS WERE DUE TO EVERYONE'S CONTRIBUTION**
- c) **HOPE FOR POSSIBILITY OF 'DOING IT AGAIN'**


TEAMWORK - SUMMARY

- ✓ **THE GROUP BEGINS BELOW THE SUM OF THE INDIVIDUAL OUTPUT**
- ✓ **DROPS TO A LOW POINT DURING CONFLICT**
- ✓ **CLIMBS OUT WITH TRUST ESTABLISHED**

TEAMWORK - SUMMARY

- ✓ PERFORMS AT AN ELEVATED POINT WELL ABOVE THE STARTING POINT**
- ✓ THE ELEVATED PERFORMANCE IS THE MAIN REASON FOR USING THE GROUP PROCESS**

DEVELOPMENT TEAMWORK – ACCELERATING

 **FOCUS ON THE GROUP & THE TASK –
THE GROUP SOLVES PROBLEMS.
INDIVIDUAL CONFLICTS SOLVED IN
TERMS OF TASK.**

 **CLARIFY THE TASK WITH A GOOD SPEC.**

 **INCLUDE QUIET PEOPLE IN DISCUSSIONS**

TEAMWORK – ACCELERATING DEVELOPMENT

 **TEMPER THE DOMINANT PERSON BY ASKING FOR THE VIEWS OF OTHERS**

 **DOCUMENT IMPORTANT DECISIONS FOR EASY REFERENCE IN CLEAR AND CONCISE TERMS**

TEAMWORK – ACCELERATING DEVELOPMENT

- 6) ALL CRITICISM MUST BE TASK ORIENTED WITH A POSITIVE SUGGESTION FOR IMPROVEMENT
- 7) PRAISE POSITIVE ACTIONS
- ④ DEAL WITH FAILURE CAREFULLY. EXAMINE THE SOURCE & DELEGATE THE SOLUTION TO WHERE THE INITIAL PROBLEM DEVELOPED.

TEAMWORK – ACCELERATING DEVELOPMENT

- 9) HANDLE DEADLOCK. DISCUSS ALL VIEWPOINTS. ALLOT A TIME FOR DEBATE AND THEN GET ON WITH A GROUP AGREEMENT**

- 10) AS POINTS ARE DISCUSSED, MAKE SURE YOU DON'T REPEAT AND GO INTO A 'DO' LOOP**

TEAMWORK – ACCELERATING DEVELOPMENT

11) EVALUATE ALTERNATIVES. PICK ONE
AND MONITOR OUTCOME. BE
PREPARED FOR CHANGE.

12) COMMUNICATE ACTIVELY, SPEAKING
AND LISTENING. SUMMARIZE
AGREEMENTS

TEAMWORK - CONCLUSION

- ❑ **TEAMS ARE RELATIONSHIPS & MUST BE WORKED**
- ❑ **THE TEAM IS RESPONSIBLE TO ITSELF. THAT RESPONSIBILITY ACCELERATES THE GROUP PROCESS**
- ❑ **THE TEAM NEEDS MUST BE RECOGNIZED & DEALT WITH BY THE GROUP**
- ❑ **THE TEAM MUST ESTABLISH A PLANNED, MONITORED & REVIEWED GROUP PROCESS JUST LIKE ANY OTHER MANAGED PROCESS.**

TEAMWORK - CONCLUSION

- ❑ THE POWER OF TEAMWORK IS USED THROUGHOUT INDUSTRY
- ❑ TEAMWORK TRAINING IS HELD REGULARLY
- ❑ TEAM PARTICIPATION IS EXPECTED
- ❑ CAREER GROWTH WILL TRACK PROGRESS WITHIN TEAM ENVIRONMENTS

TEAMWORK - CONCLUSION

- TEAM LEADERSHIP IS A STEPPING STONE TO A SUCCESSFUL CAREER**
- IT IS WITHIN THE TEAM THAT AN ENGINEER'S COMMUNICATIVE SKILL IS DEMONSTRATED**
- AVOIDANCE OF TEAMWORK WILL CUT OFF ADVANCEMENT**