



**FAILURE  
IS  
AN OPTION!**



**AMERICAN TOWER®**

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**BROADCASTERS KNOW!**

**STUFF  
HAPPENS**

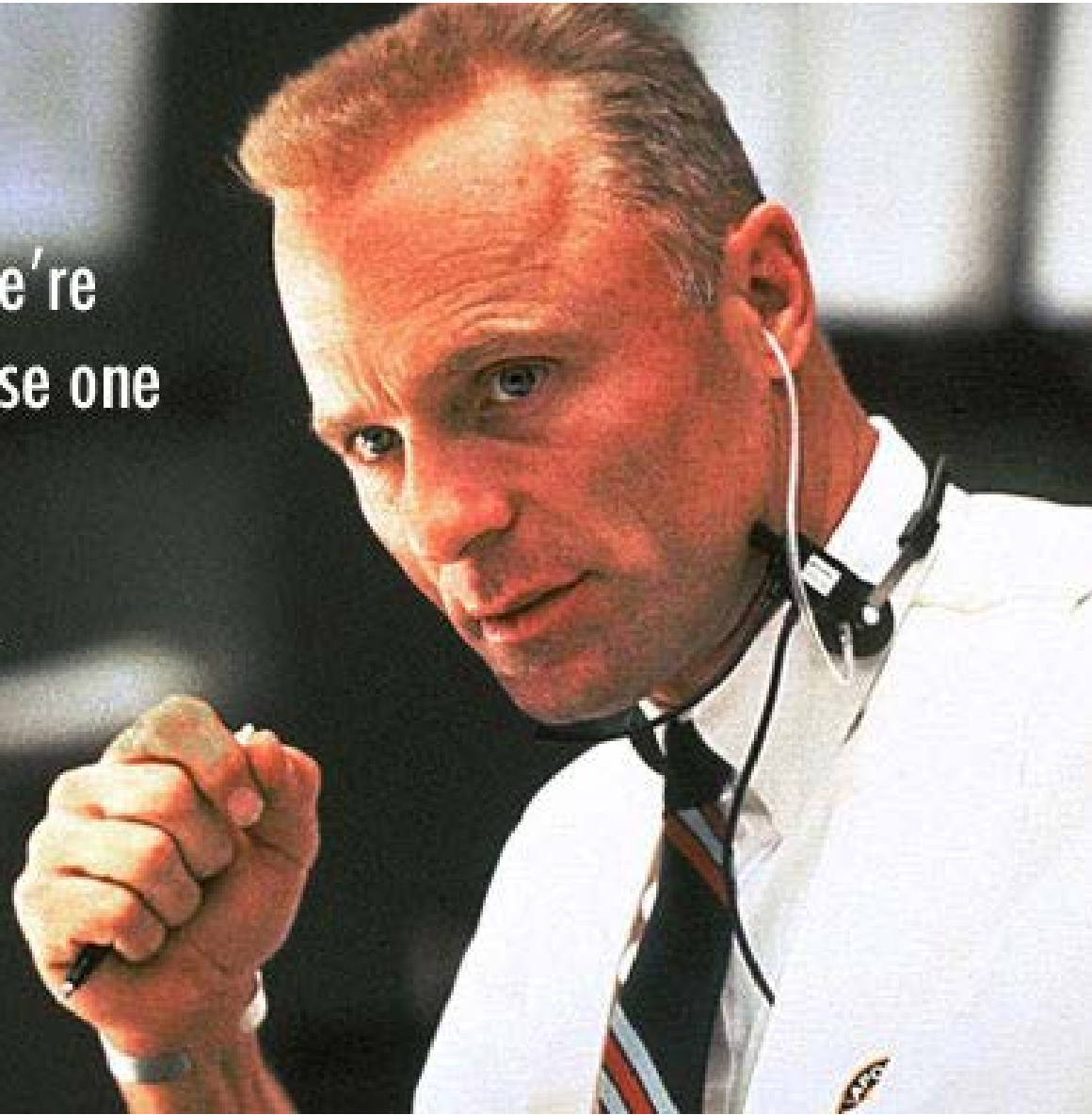


# HOW APOLLO LOOKED AT IT

"We've never lost an American in space and we're sure as hell not gonna lose one on my watch!

Failure is not an option."

Gene Kranz, Apollo 13



# Top 5 Causes of Tower Failure

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**Construction Errors      31%**

**Ice      29%**

**Special Wind      19%**

**Aircraft      11%**

**Anchor Failure      10%**



# TOWERS:



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# TOWERS:



# ANTENNAS:

## ❑ Failure Mechanisms

- Water / Ice
- Over-power
- Mechanical stress
- Radome failure
- Workmanship







# ANTENNAS:



# TRANSMISSION LINES:

## ☐ Failure Mechanisms

- Water
- Worn or frozen contacts
- Over-power
- Mechanical stress
- Workmanship















# CHANNEL COMBINERS:

## ❑ Failure Mechanisms

- Over-power
- Contact
- Mechanical stress
- Workmanship





# CHANNEL COMBINERS:



**BUT...  
BOY SCOUTS KNOW THE  
SECRET!**



# PREVENTIVE MAINTENANCE:

- ❑ Analyze tower to current specs
- ❑ Inspect components
  - Steel
  - Guys
  - Anchors
  - Antenna
  - Transmission lines & hangers
- ❑ Protect from ice



# PREVENTIVE MAINTENANCE:

- ☐ Keep antenna and coax pressurized
- ☐ Electrical evaluation semi-annually including TDR
- ☐ Monitor & log performance
  - VSWR
  - Pressure



# BACK UP PLAN:

- ☐ Maximize vertical separation
- ☐ Separate sites best
- ☐ Master systems, high performance at low cost
- ☐ Ensure back-up power available



# SPECTRUM AUCTION:

- ❑ Begins early 2016
- ❑ Most TV stations rechanneled
- ❑ Tower modification/upgrade necessary
- ❑ Antennas swapped over 39 month period
- ❑ FM's severely impacted



# HOW CAN ATC HELP?

- ☐ Vast array of tower resources
- ☐ 61 FM & UHF master antenna systems
- ☐ Multiple towers in most markets
- ☐ Most with back-up power



**DON'T LET FAILURE  
BE THE OPTION YOU  
CHOOSE!**

