



# 2022 CECOP Symposium • Washington, DC

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# Supply Chain Disruptions

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## Agenda

- ☐ Causes of Supply Chain Disruptions
- ☐ Current supply chain disruptions
- ☐ Impacts
- ☐ Inflation
- ☐ Why are we in this position?
- ☐ Next Steps

## COVID-19

Supply shortages, unpredictable forecasting, logistic roadblocks, etc.

## Natural Disasters

Fires, hurricanes, deep freezes, etc.

## Geo-Political Events

Russia/Ukraine Conflict, sanctions, border closures, adversarial threats etc.

## Fluctuations in Demand

Supply and demand are not equal so suppliers are unable to accurately forecast supply needs

## Inflation

Consumer spending variabilities

## Current Supply Chain Disruptions

### Electronic Materials

- Resistors
- Integrated Circuits
- Cables and Connectors
- Wires
- Coax Coating
- Semiconductor Chips
- Printed Circuit Board Assemblies (PCBAs)
- Fiber optic Cable
- Rare-metal components
- Hardware
- Capacitors

### Chemicals

- Neon Gas
- Caustic Soda
- Isocyanate
- Phosphates
- Dessicants - silica gel
- Plastics - common grades
- Acrylonitrile Butadiene Styrene (ABS)
- Polymer adhesives (particularly 3M products)
- Blasting media- abrasive powder
- Ethylene Glycol
- 1-Methyl-2-pyrrolidinone (NMP)
- Anti-foam fluid

### Labor per Industry

- Manufacturing (non-durable goods)
- Transportation (beginning to recover)
- Warehouses (beginning to recover)
- Manufacturing (durable goods)
- Wholesale Trade
- Construction (beginning to recover)

### Construction Materials

- Concrete
- Forklifts
- Fleet vehicles
- Steel
- Lumber
- Aluminum
- Gypsum
- Pipes
- Insulation
- Polyvinyl Chloride (PVC)
- HVAC
- Boilers
- Paint
- Gypsum wallboard

### Metals

- Copper
- Kovar
- Rare Earth Metals (Erbium, Scandium)
- Molybdenum metal sheets and powder
- Aluminum
- Steel
- Tin products
- Iron
- Palladium
- Copper foil
- Nickel
- Titanium
- Lithium
- Cobalt

### Packaging / Shipping

- Corrugated Packaging
- Crude Oil / Diesel Fuel
- Plastic Containers
- Pallets
- Polyethylene (PE)
- Polypropylene (PP)
- Monoethylene (MEG)
- Polystyrene foam
- Epoxy packaging

### Raw Materials

- Rubber-Based Products
- Resin-Based Products
- Plastics / Plastic Resins
- Rubber
- Glass
- Adhesives
- Medical lab equipment
- Pipettes
- Dry ice
- Oil and gas
- Lithium
- Silicon
- Molybdenum
- Epoxy curing agents



## Potential Impact of Raw Material Shortages

- Budgets do not included rising material costs
- Life of Program buys risk design changes
- Long lead times are impacting which FY a procurement is costed

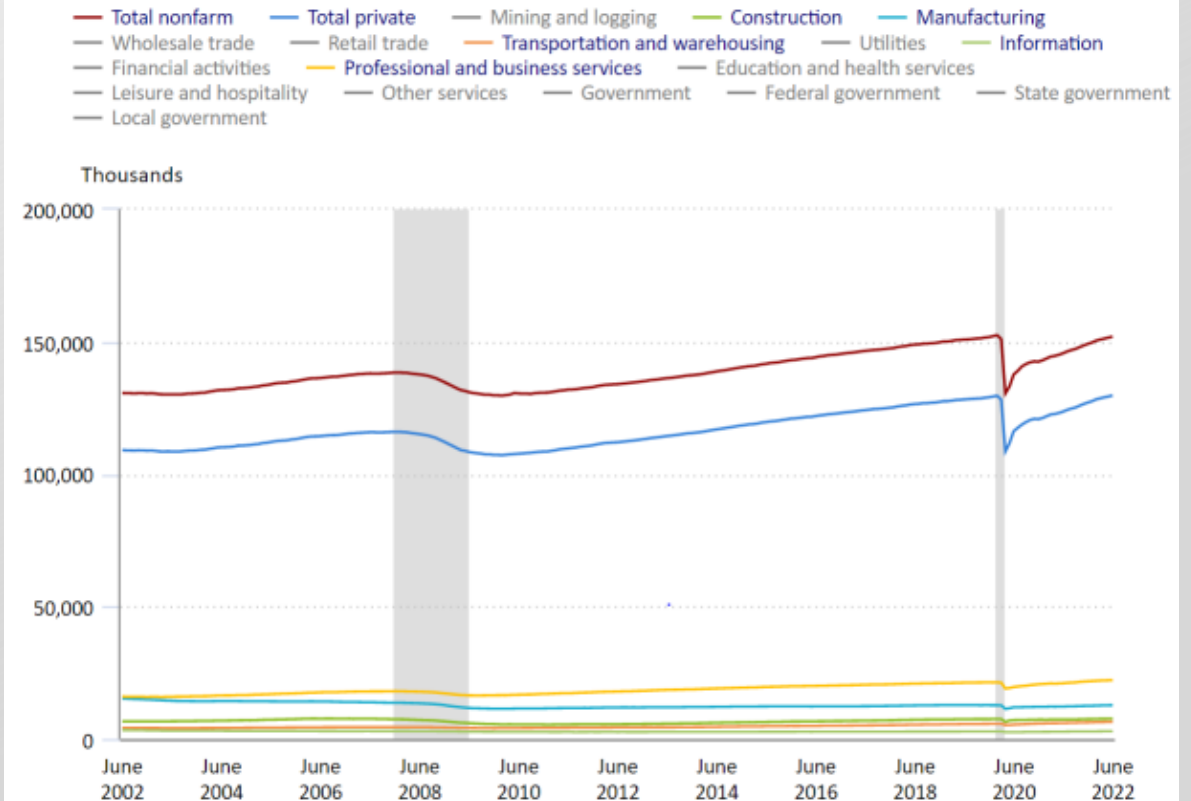


## Potential Impact of Personnel Shortages

- Labor issues over the past few years has likely contributed to inflation
- Labor issues over skilled laborers who can manufacture durable goods to DOE/NNSA standard/specifications
- Labor issues continue in transportation and warehousing which is causing ripple effects throughout the supply chain

Employment levels by industry, seasonally adjusted

Click and drag inside chart to change dates displayed



Hover over chart to view data.

Note: Shaded areas represent recessions, as determined by the National Bureau of Economic Research.

Source: U.S. Bureau of Labor Statistics.

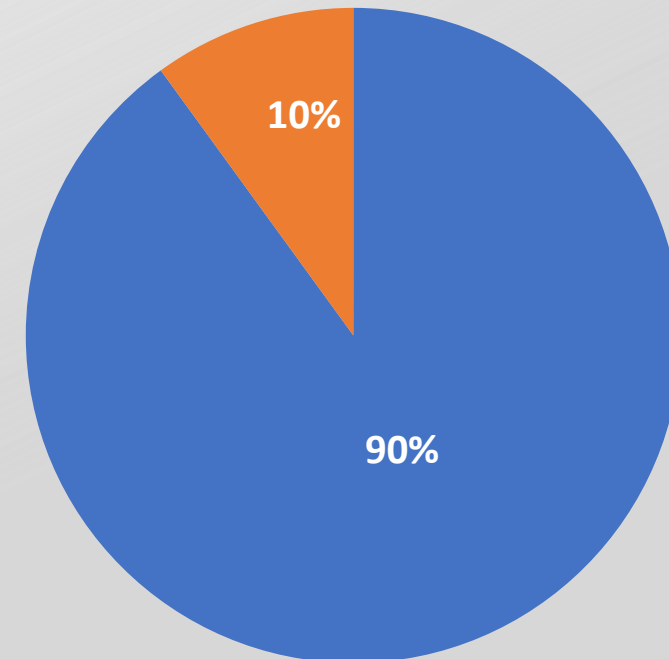


## Potential Impact of Semiconductor Shortages

- Price of neon went up 600% since the annex of the Crimean peninsula
- Semiconductor Industry Association said 'there will not be an immediate supply chain disruption risk'
  - Companies have been stockpiling neon since 2020
  - Companies are prepared to recycle the neon
  - Only short term fixes
- Experts anticipated shortage would only be through 2022, with Russia/Ukraine conflict, it could be much longer
- Even if the gas shortage is fixed, the war will still cause problems (palladium, other rare earth metals, etc.)

### NEON GAS MANUFACTURING PLANTS

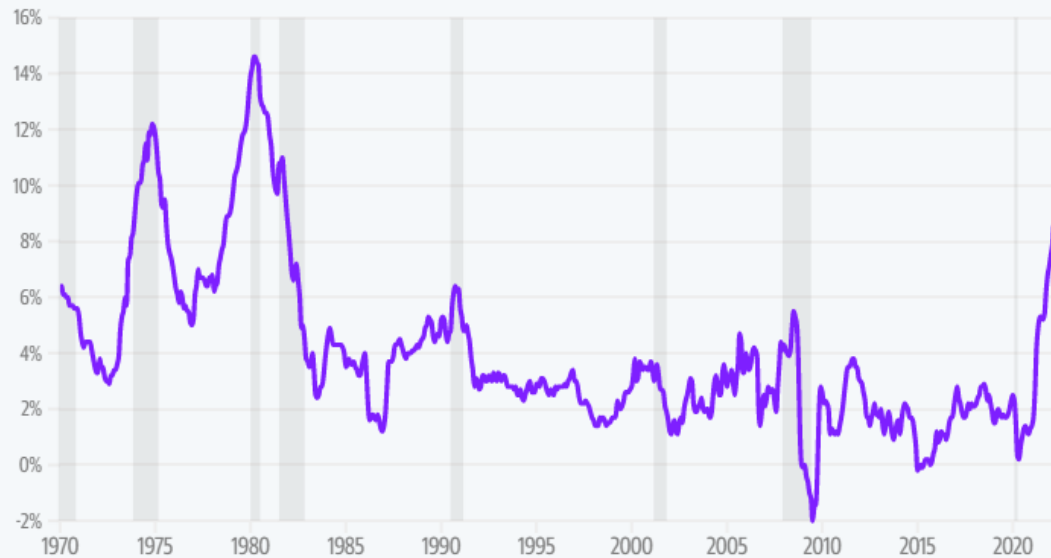
■ Ukraine ■ Other Countries



## Inflation – As of 7/13/2022

### INFLATION SURGES TO A NEW 40-YEAR HIGH

U.S. CONSUMER PRICE INDEX, YEAR-OVER-YEAR CHANGE SINCE 1970

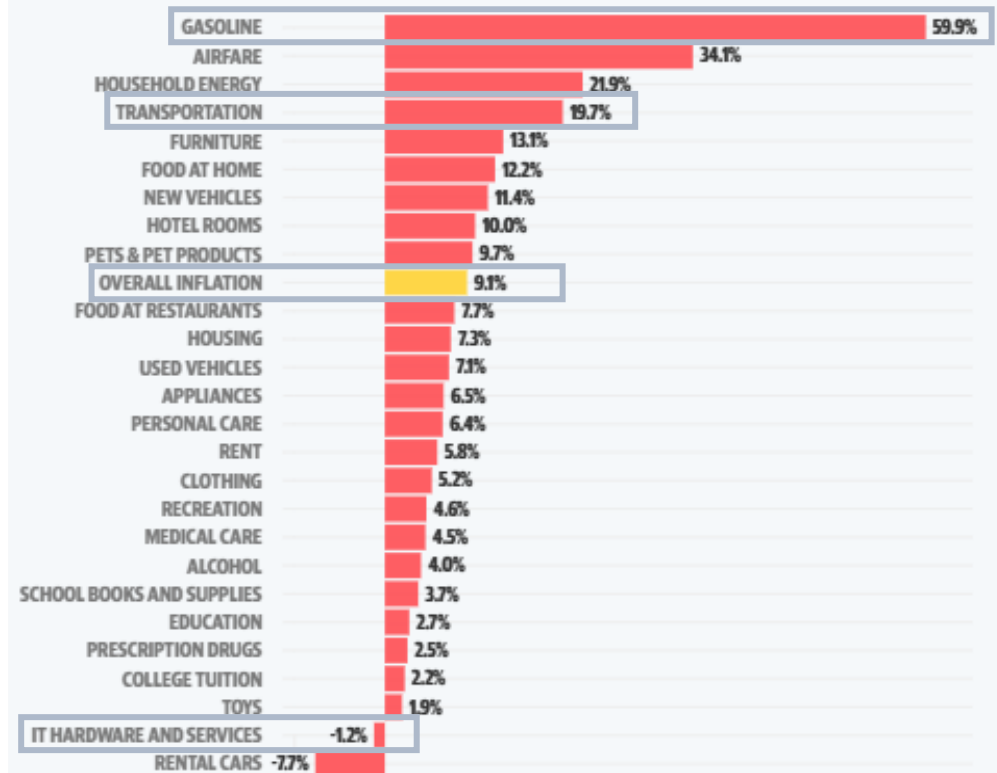


SOURCE: U.S. BUREAU OF LABOR • SHADED AREAS INDICATE U.S. RECESSIONS

**yahoo!**  
finance

### WHERE INFLATION IS... AND ISN'T

12-month change in the price of:



SOURCE: BUREAU OF LABOR STATISTICS. DATA AS OF JUNE 2022

**yahoo!**  
finance



## Inflation Impact Considerations

- 1) Identify a reliable source for an increased inflation rate for use in cost estimating
- 2) Determine if the program is actually experiencing inflation at a material level and should be considered during FY budgets
- 3) Consider building in higher than expected cushion costs to budgetary estimates for specific purchases

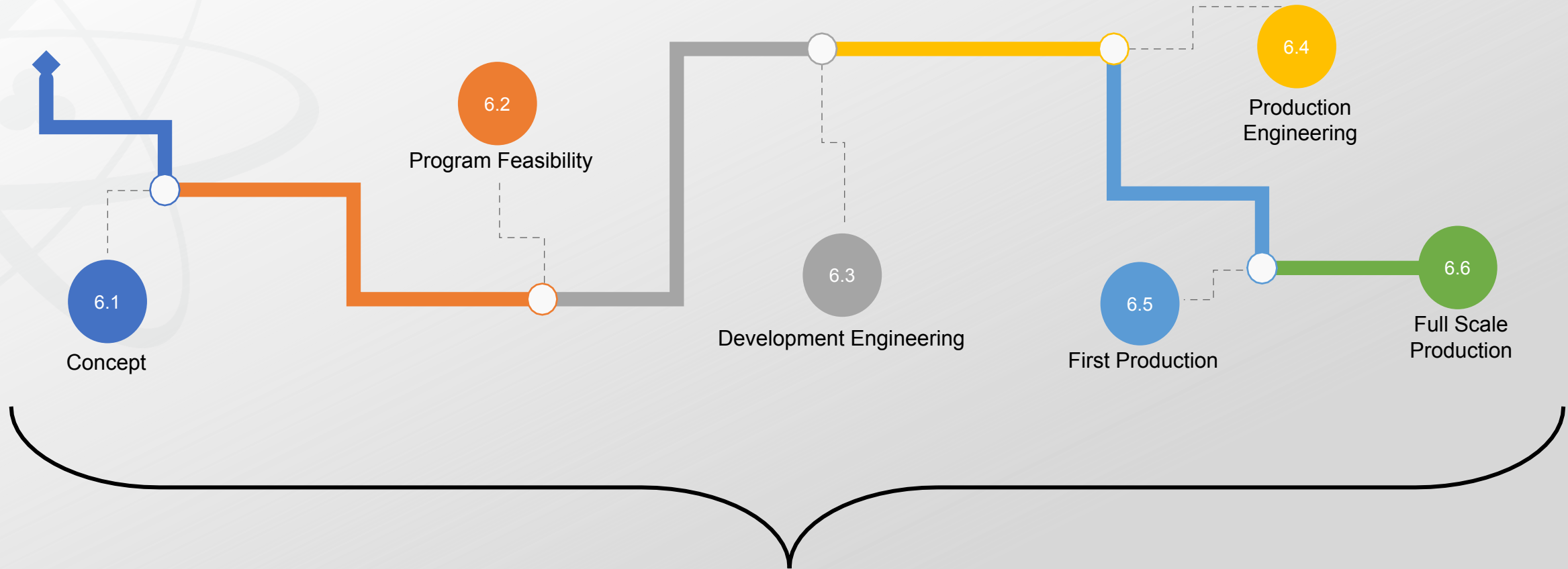
## Additional Root Causes

- Current systems do not account for disruptions
  - Typically based on internal/historical data
- Inability to share issues and mitigation strategies
- Considering supply chain throughout the entire lifecycle of a program



## Next Steps to Consider

- Create reliable predictive analysis utilizing post-COVID data
- Ensure partnership between Supply Chain Professionals, Cost-Estimating Professionals, Engineers, Project Managers
- Strongly consider specific supply chain mitigations
- Integrate Supply Chain disruptions throughout lifecycle

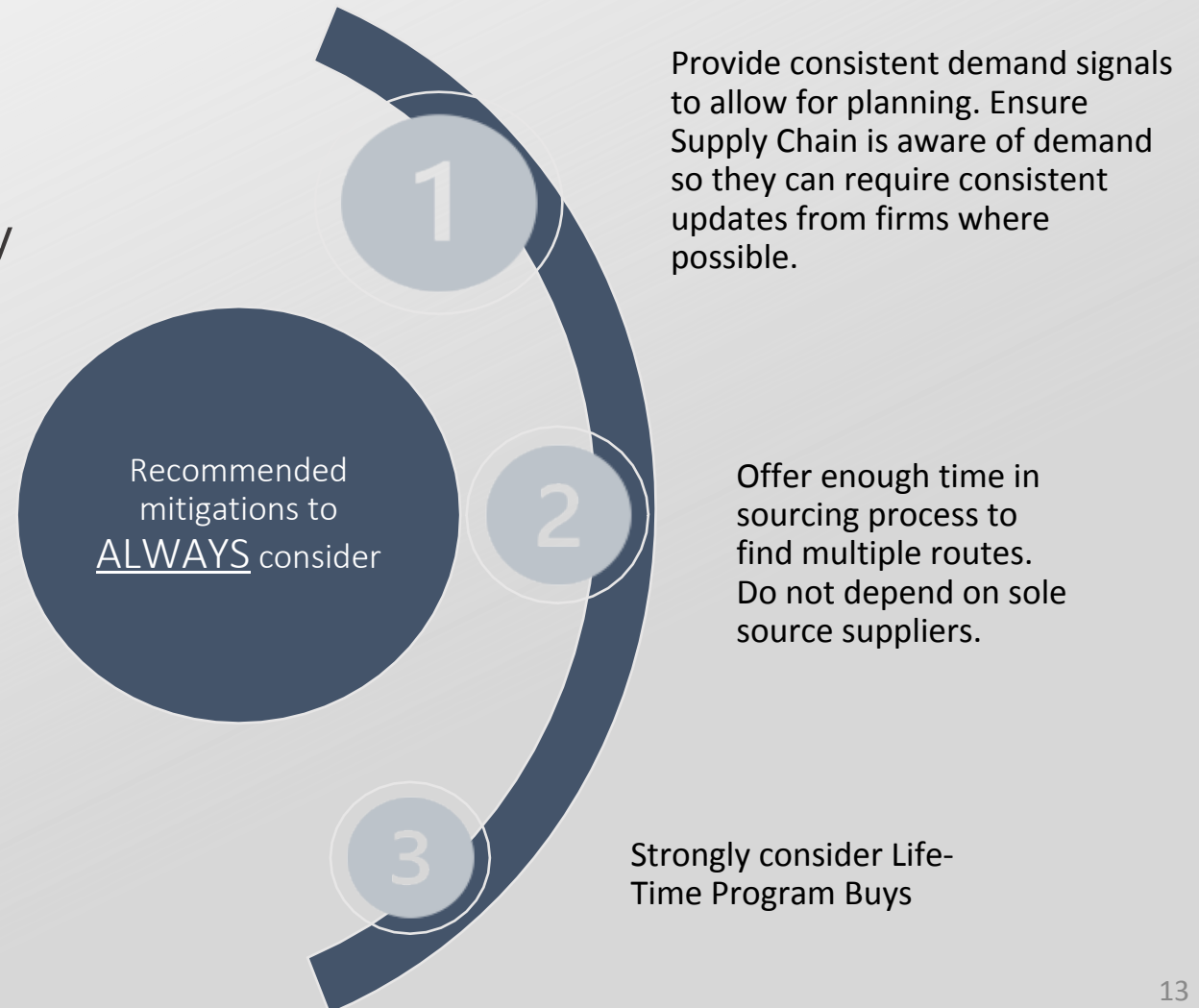


Supply Chain Disruptions Impact **ALL**  
stages of the supply chain process



## Mitigation Strategies

- Address supply chain disruptions at every stage of your supply chain process
- Build in cushion in cost
- Order parts significantly sooner than anticipated
- Begin to explore and build up a logistics plan for housing life of program buy purchases





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Thank you!