



Annual Asset Health Update

THE
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PEOPLE

NPPD Board of Directors Meeting
Strategic Business Matters
December 2023

Mark Fletcher, Engineering Supervisor – Asset Health
Matt Gilliland, Director of Operations Support &
Business Continuity
Khalil Dia, Site Vice President
Kirk Evert, Canaday/Water/Renewable Energy Manager
David Dubowsky, Director of Operational Technology &
Security



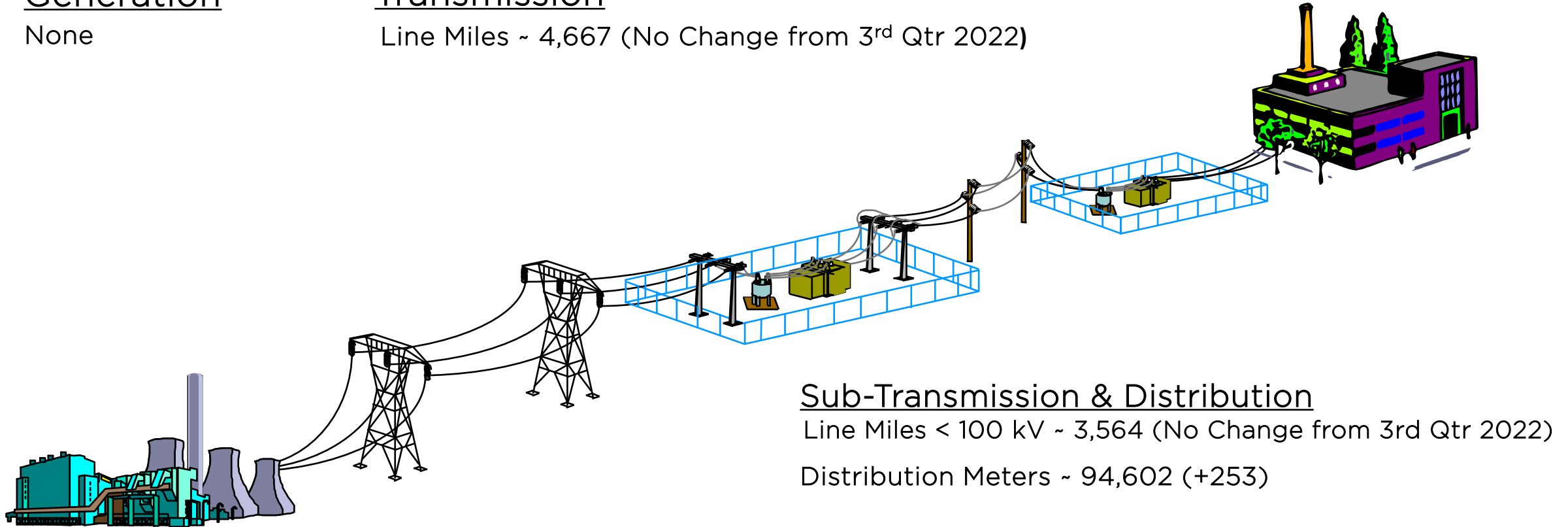
Changes to District Assets

Generation

None

Transmission

Line Miles ~ 4,667 (No Change from 3rd Qtr 2022)














*We are monitoring and maintaining in excess of 250,000 components

Transmission and Distribution

Take a Closer Look – **STRATEGY MAP**  **KPIs**

 - Under Target
  - Caution
  - On Target

| | | | |
|---|--------------------------|---|---------------------------------|
|  | Batteries - Transmission |  | Poles - Transmission |
|  | Breakers - High Voltage |  | Relays - NERC |
|  | Lines - Transmission |  | Relays - Non-NERC |
|  | Poles - Distribution |  | Transmission RTUs |
|  | Poles - Sub-Transmission |  | Transformers - Sub-Transmission |
| | |  | Transformers - Transmission |

NERC = North American Electric Reliability Corporation
 RTU = Remote Terminal Unit

Transmission and Distribution Reliability Metrics

Take a Closer Look –
STRATEGY MAP



KPIs

 - Under Target  - Caution  - On Target

| | |
|--|---|
| | SAIDI - System Average Interruption Duration Index |
| | SAIFI - System Average Interruption Frequency Index |
| | CEMI - Customers Experiencing >3 Interruptions |
| | TACOF - Transmission Average Circuit Outage Frequency |
| | TRIND - Transmission Index (Preventable) |

Asset Health Focal Areas

- Poles (Distribution and Sub-Transmission Round Wood)
 - Distribution Poles reflect Caution, >2% reject (3.8%). Trending steady, will be replaced or reinforced by the end of 2024
 - Sub-Transmission Poles are good, but recent inspection results with UAS platforms and line patrols may cause a declining trend
- Breakers
 - Continue to assess aging assets and update plans for refurbishment or replacement
- Station Class Power Transformers – Sub-Transmission
 - Continue to assess aging assets and loading; update plans for refurbishment or replacement based upon condition and load growth
- Transmission Remote Terminal Units (RTUs)
 - Continue replacement of RTUs

Operations Support Team

- Fleet Services
- Aviation
- Facilities Services
- Inventory/Investment Recovery
- Drafting
- Business Continuity



- Under Target

- Caution

- On Target

| Sept. KPI's | Idling | Utilization | Repair Expense |
|--------------|-----------|-------------|-----------------------|
| | true idle | miles/hrs | repair costs per mile |
| Heavy-Duty | <20% | >1,300 | <\$.78 |
| Medium-Duty | <28% | >735 | <\$1.20 |
| Light-Duty | <18% | >1,200 | <\$.31 |
| Aerial | <15% | >775 | <\$1.37 |
| Crane/Digger | <15% | >400 | <\$2.60 |

Operations Support Focus Areas

- **Fleet Services**
 - Electric Vehicles
 - Industry Challenges
- **Aviation**
 - Uncrewed Aerial Systems (Drones) and Artificial Intelligence
 - Sustainable Aviation Fuel (SAF)
- **Facilities Services**
 - Propagate EV charging stations
- **Inventory/Investment Recovery**
 - Supply Chain Disruption
- **Drafting**
 - 3D Modeling
- **Business Continuity**
 - Grid Ex VII, November 2023

Cooper Nuclear Station



| | | | |
|---|----------------------------------|---|--|
| | Reactor Vessel Internals | | Switchyard |
| | Primary Containment | | Transformers |
| | Condenser | | Emergency Diesel Generator (EDG) |
| | Intake Structure | | Batteries |
| | Turbines | | Large Pumps |
| | Turbine Generator Control System | | Large Electric Motors |
| → | Main Generator | | High Pressure Cooling Injection (HPCI) |
| | Main Generator Exciter | | Reactor Core Isolation Cooling |
| | Critical Fan Coil Units (FCU) | | Neutron Monitoring System |
| | Feedwater Heaters | | Radiation Monitoring System |
| | Heat Exchangers | | Riverwell System |
| | Circuit Breakers | | Service Water |
| | Optimum Water Chemistry System | → | Augmented Off Gas (AOG) |

| | | | |
|-----------------|------|------|-----------|
| NEEDS ATTENTION | FAIR | GOOD | EXCELLENT |
|-----------------|------|------|-----------|

Cooper Nuclear Station Equipment Focus Area



- Main Generator
- Augmented Off Gas Reliability

Production

| Generation: | Boiler Fuel | Cooling/ Circulating Water | Control System | Generator & Exciter | Transmission (Main Power Transformer) | Emergency Electrical | Feedwater | Station DC Voltage | Station Power Distribution | Steam Generating | Turbine |
|-------------|-------------|----------------------------|----------------|---------------------|---------------------------------------|----------------------|-----------|--------------------|----------------------------|------------------|---------|
| GGs 1 | Yellow | | | | | | | | | Yellow | |
| GGs 2 | Yellow | | | | | | | | | Yellow | |
| SS 1 | Yellow | Red | | | | | Yellow | | | Red | |
| SS 2 | Yellow | Yellow | | | | | | | | Red | |
| BPS | | | | | | | | | | | |
| CPS | | Yellow | | | | | | | | | |

| | Control System | Transmission | Communication | Blades | Drive Train | Generators | Towers | Voltage Control | Condition Monitoring | Rotor Positioning |
|------|----------------|--------------|---------------|--------|-------------|------------|--------|-----------------|----------------------|-------------------|
| AWEF | | | | Yellow | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |

Needs Attention Fair Good Excellent

Production Targeted Benchmarks

Take a Closer Look – STRATEGY MAP



KPIs

 - Under Target

 - Caution

 - On Target

| | | | |
|--|--|--|--|
| | Equivalent Availability Factor – Beatrice Power Station | | Equivalent Forced Outage Rate – Sheldon Station Unit 1 |
| | Equivalent Availability Factor – Gerald Gentleman Station Unit 1 | | Equivalent Forced Outage Rate – Sheldon Station Unit 2 |
| | Equivalent Availability Factor – Gerald Gentleman Station Unit 2 | | |

Production Program Focus Areas

- **Reliability, Fixed Cost and Market Performance**
 - Review structural changes implemented for fixed cost control
 - Selective capital and O&M work to maintain reliability
 - Units available when called upon by the market
- **Compliance**
 - Environmental regulations
- **Staffing and Knowledge Retention**
 - Critical skills on shift

Enterprise Technology

| | |
|---|-------------------------------|
| ↑ | Cyber Security |
| ↑ | Physical Security |
| → | NERC Compliance |
| → | Internet Connectivity |
| ↑ | Business Network Connectivity |

| | |
|---|--------------------------------|
| → | Business Server Infrastructure |
| ↑ | Organizational Data |
| → | Backup/Recovery System |
| ↑ | Critical Business Systems |
| | |

| | |
|--|-----------------|
| | Excellent |
| | Good |
| | Fair |
| | Needs Attention |

| | |
|---|-----------|
| ↑ | Improving |
| → | Steady |
| ↓ | Degrading |

Enterprise Technology Focus Areas

- Continued expansion of security (physical and cyber) monitoring, alerting, and protection of the organization
 - Exercise and drill response plans at all levels
 - Integrate lessons learned from industry and drills
 - Advance knowledge of teammates (District and Enterprise Technology)
 - Enhancement of risk portfolio and mitigation strategies
- Prioritization of baseload work and projects based on available resources (human and financial) while ensuring a reliable, secure, and resilient system



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Questions

Stay connected with us.

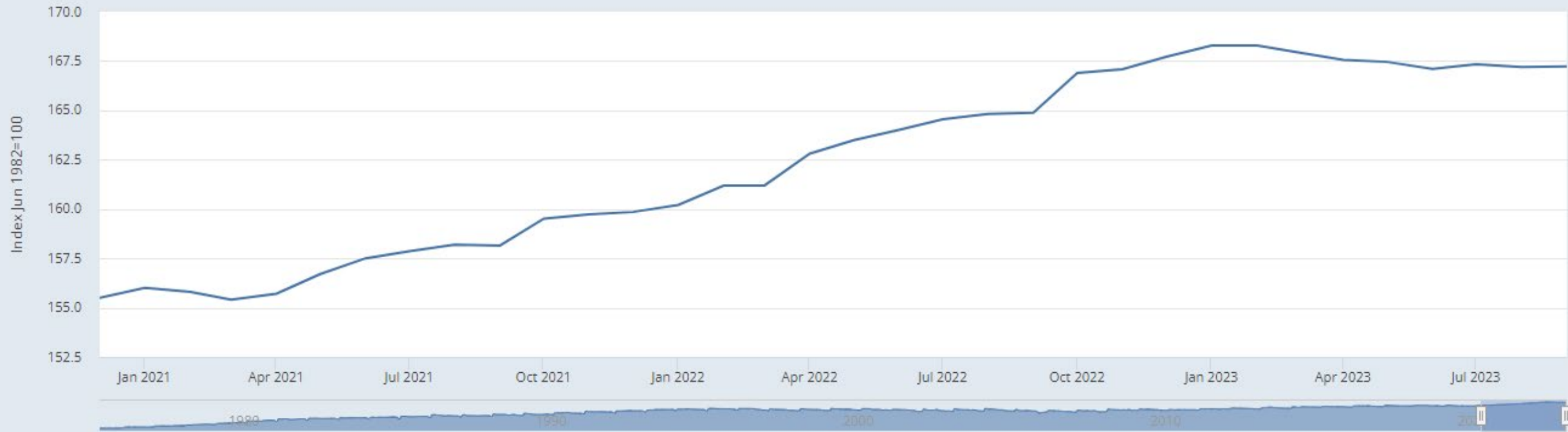


Nebraska Public Power District

Always there when you need us

Fleet Challenges

FRED — Producer Price Index by Industry: Automobile, Light Truck and Utility Vehicle Manufacturing



Shaded areas indicate U.S. recessions.

Source: U.S. Bureau of Labor Statistics

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Fleet Challenges



— Producer Price Index by Industry: Heavy Duty Truck Manufacturing



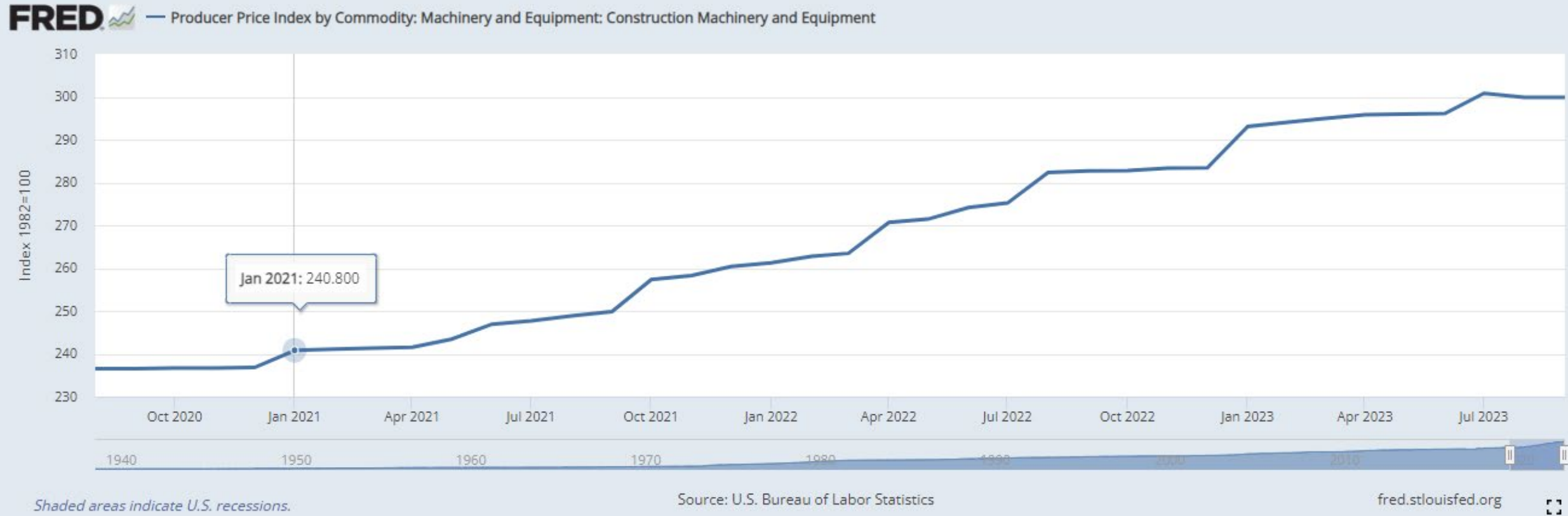
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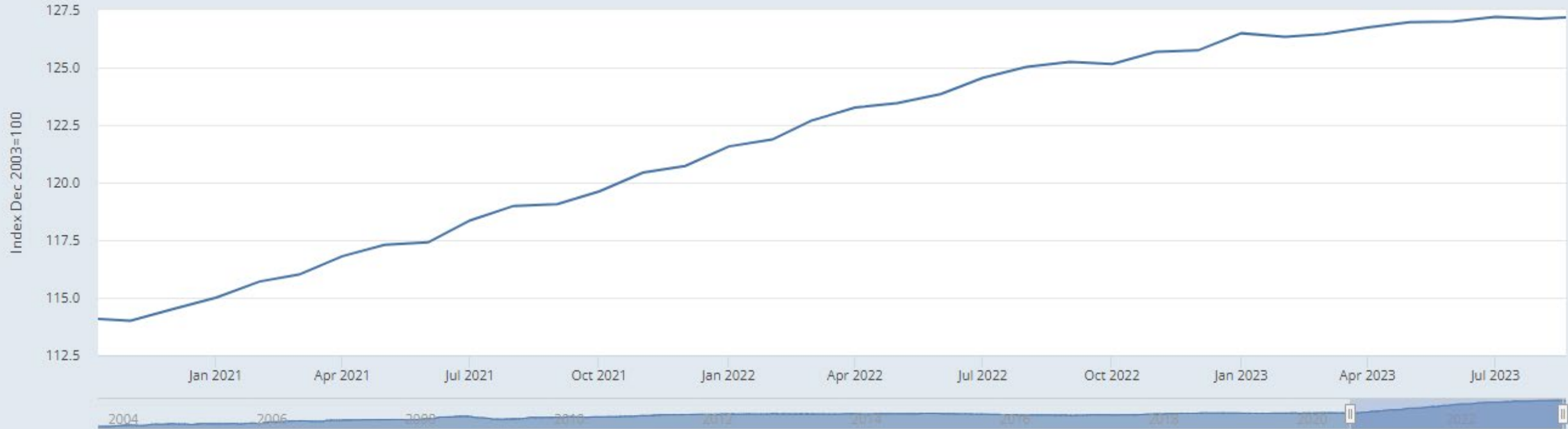
Fleet Challenges



Fleet Challenges

FRED

— Producer Price Index by Industry: Motor Vehicle Parts Manufacturing



Shaded areas indicate U.S. recessions.

Source: U.S. Bureau of Labor Statistics

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Fleet Challenges

