

*What does it take to be a
vendor in the nuclear
industry?*

*Paxton & Vierling Steel Co.
Division of Owen Industries, Inc.*

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Director of Quality Systems



Presentation Agenda

- **Company Overview**
- **PVS Fabrication-Nuclear Experience**
 - ❖ PVS Nuclear Program Highlights
 - ❖ Compliance Process
 - ❖ PVS Shop Production & QA/QC Inspection Experience
- **Questions**



Northern Plains Steel

Steel Service Center
Fargo, ND

Missouri Valley Steel

Contract Manufacturing
Sioux City, IA

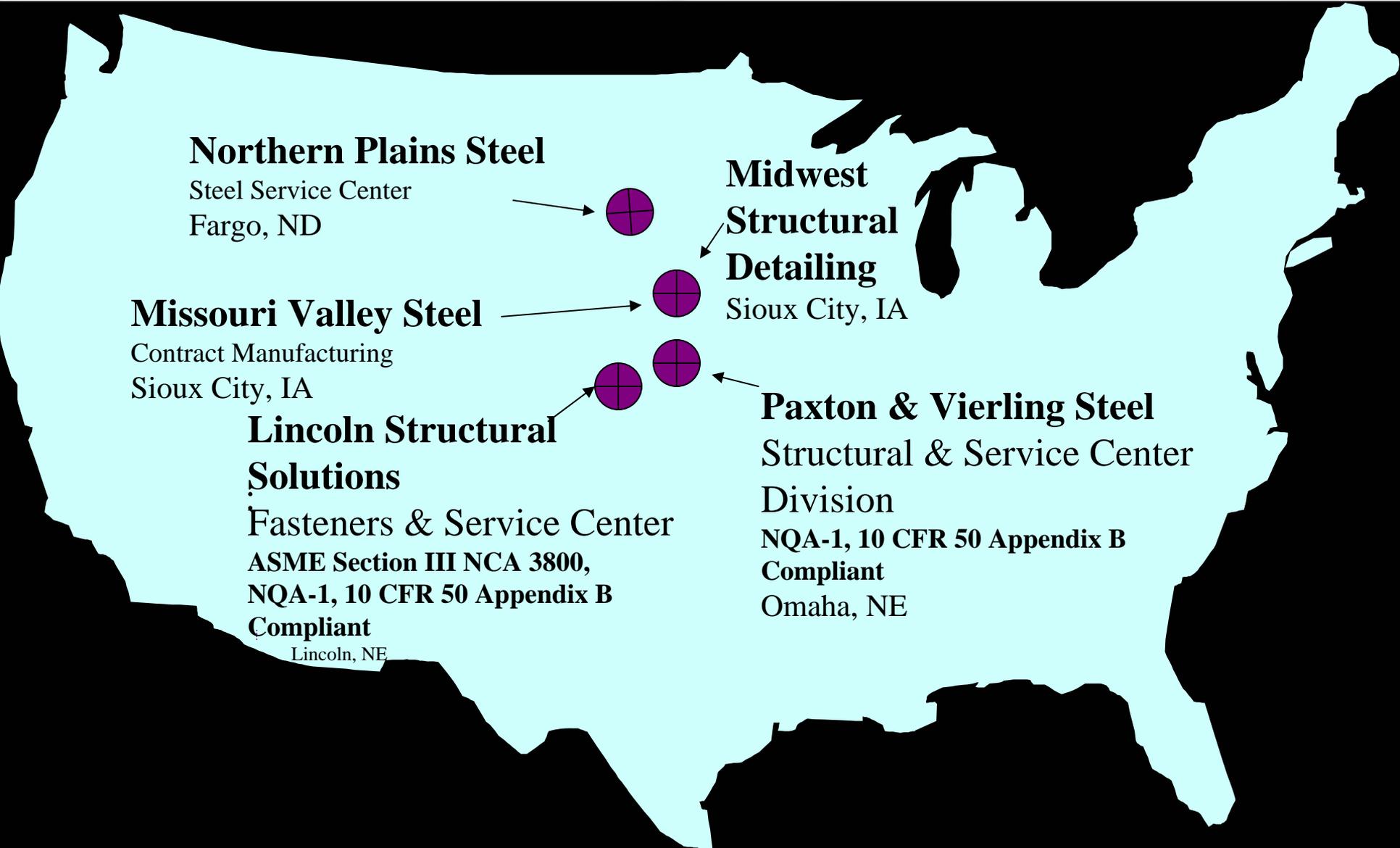
Lincoln Structural Solutions

Fasteners & Service Center
ASME Section III NCA 3800,
NQA-1, 10 CFR 50 Appendix B
Compliant
Lincoln, NE

Midwest Structural Detailing

Sioux City, IA

Paxton & Vierling Steel
Structural & Service Center
Division
NQA-1, 10 CFR 50 Appendix B
Compliant
Omaha, NE





River Protection Project / Waste Treatment Plant

Owner: DOE

EPC: Bechtel/Washington

Project Size:

- ~ 15 Billion Dollars
- ~ 40,000 Tons Structural Steel
- ~ 100,000 Tons Rebar
- ~ 200,000 Cu Ft Concrete



Lab Building



Fort Calhoun Nuclear Plant Retro-fit & Refueling

Owner: OPPD
EPC: Bechtel

Project Size:

- \$350 Million
- 300 Tons Structural & Misc Steel (High MPT)
- Critical Quality Elements
- Machined Components w/ High Tolerances





Nuclear Projects

Civilian Nuclear Projects

Quality Requirements

- 10 CFR 50 Appendix B
 - Quality requirements that cover all system, components and material important to the safe operation of the plant
- 10 CFR 50, Part 21(Reporting Defects)
- ASME Section III
 - Cover material, parts and components related to the cooling system of the reactor
 - ASME N Type Stamps and QSC designations



Nuclear Projects

Department of Energy Projects

Quality Requirements

- 10 CFR 830 Subpart A (Nuclear-Programmatic)
- 10 CFR APP 820 App. A (Price Anderson)
- ASME NQA-1
- DOE O 414.C (Quality Assurance)



PVS Quality Management Programs

- **Nuclear Program Highlights**
 - ASME NQA-1 1989, 1994, 2000, 2004, 2008, 2009 Adenda (Nuclear Quality Assurance)
 - 10 CFR PART 50 APPENDIX B
 - ANSI N45.2
 - DOE 414.1C
 - 10 CFR PART 21/PAAA



Nuclear Quality Program Compliance Process

- **PVS Road To Compliance Process**
 - **Develop Quality Program**
 - **Train personnel**
 - **Implement Program**
 - **Audit Suppliers**
 - **PVS Production and QA/QC Experiences**



Develop Quality Program

Paxton & Vierling Steel Company

- Decided in 2001 to upgrade our current ISO 9001 program and procedures to meet the quality system requirements for the DOE/Bechtel River Protection Project.
- Company completed updated quality program and began work on the River Protection Project in 2002.
- In 2007, PVS added a nuclear supplement to our base quality manual as an enhancement to our nuclear quality program (10 CFR 50 App. B, NQA-1/ANSI 45.2)
- Currently PVS is finalizing a stand alone nuclear quality manual that addresses NQA-1, 10 CFR 50 App. B and ANSI 45.2. This document will replace our base manual and nuclear supplement for nuclear projects.
- Once your company reaches the quality level needed to meet commercial nuclear requirements you don't change requirements for each project.



Develop Quality Program

Procedure Additions-NQA-1

- **Qualification and Certification of Inspection Personnel** NQA-1 Req. 2
- **Lead Auditor Qualification** NQA-1 Req. 2
- **Vendor Survey/Audit** NQA-1 Req. 7
- **Internal Audits** NQA-1 Req. 18
- **Nuclear Record Retention** NQA-1 Req. 17
- **Counterfeit Part**
- **Structural Fabrication NDE Shop Inspector Qualification** NQA-1 Req. 2
- **NQA-1 Projects-Purchasing, Receipt, Traceability and Processing of Material** NQA-1 Req. 4,7,8
- **Dedication of Commercial Grade Items** NQA-1 Req. 7
- **Reporting of Defects and Noncompliance- 10 CFR Part 21**



Train Personnel

Nuclear Culture

- **“Verbatim Compliant” discipline is critical to formulating decisions and execution.**
- **Requires strong management commitment to quality program.**
- **“Heroism will be punished”.**
- **Technical Knowledge - verbatim compliance requires a greater degree of understanding of codes and standards. Industry relationships can be vital to interpreting codes and standards. A consultant is recommended to guide you through this process.**
- **Professionalism – the skill sets and experience necessary to meet nuclear quality, safety, technical and project management requirements demand a higher caliber of employee than a typical industrial project.**



Implement Program

- **Validate quality program has been implemented through an internal audit that demonstrates quality program has been effectively implemented**



Audit Suppliers

Supply Chain Development

- **Developing an approved supplier list is critical to supplying the nuclear industry.**
- **Suppliers need to have commercial grade surveys or appropriate audits conducted to verify commercial grade item controls or required quality system programs for safety related items are in place.**
- **Safety Related Material Suppliers- Very few suppliers are compliant to NQA-1 or ASME Section.**
- **Commercial Suppliers (Base Quality Program)-Meet requirements of material identification, traceability and verification requirements. Majority of supply chain resides in this group.-Mills, Warehouses**



Audit Suppliers Cont.

- **Commercial Suppliers (No Quality Program) Do not comply with any requirements.**
- **The lack of NQA-1 compliant vendors has forced PVS and the industry to perform commercial grade dedication.**



***PVS Shop Production /
QA/QC Inspection Lessons Learned***



PVS Shop Production / QC Inspection

NQA-1 Compliant QA/QC Inspection:

- ▲ Requires thorough understanding of NQA-1 Program and Company Quality Manual
- ▲ Certification process for Inspectors is more rigorous and longer than standard projects
- ▲ Increased interaction with Project Management, Production Workers and Customer Inspectors (Q&A)
- ▲ Increased number of verification & hold points



PVS Shop Production / QC Inspection Experience

NQA-1 Compliant Shop Production:

Fabrication is theoretically **IDENTICAL** to Industrial Projects

BUT in reality **SLOWER:**

- ▲ **Strict Interpretation of Drawings & Specification**
- ▲ **Strict Adherence to Material Traceability Regimen**
- ▲ **Increased Supervision of Production Workers (Q&A)**
- ▲ **Increased Interaction with Project Management (Q&A)**
- ▲ **Heighten Interactions with QA/QC Inspection**
- ▲ **Increased Potential Rework**



*Thank you,
Questions*



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