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# **Simulating Drop Loads Impact with FEMAP and NX NASTRAN**

**Presenter: John LeCour  
June 27, 2013**

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# **Simulating Drop Loads Impact with FEMAP and NX NASTRAN – Part 2**

**Presenter: John LeCour**

**February 28, 2013**

**10:00 am Pacific**

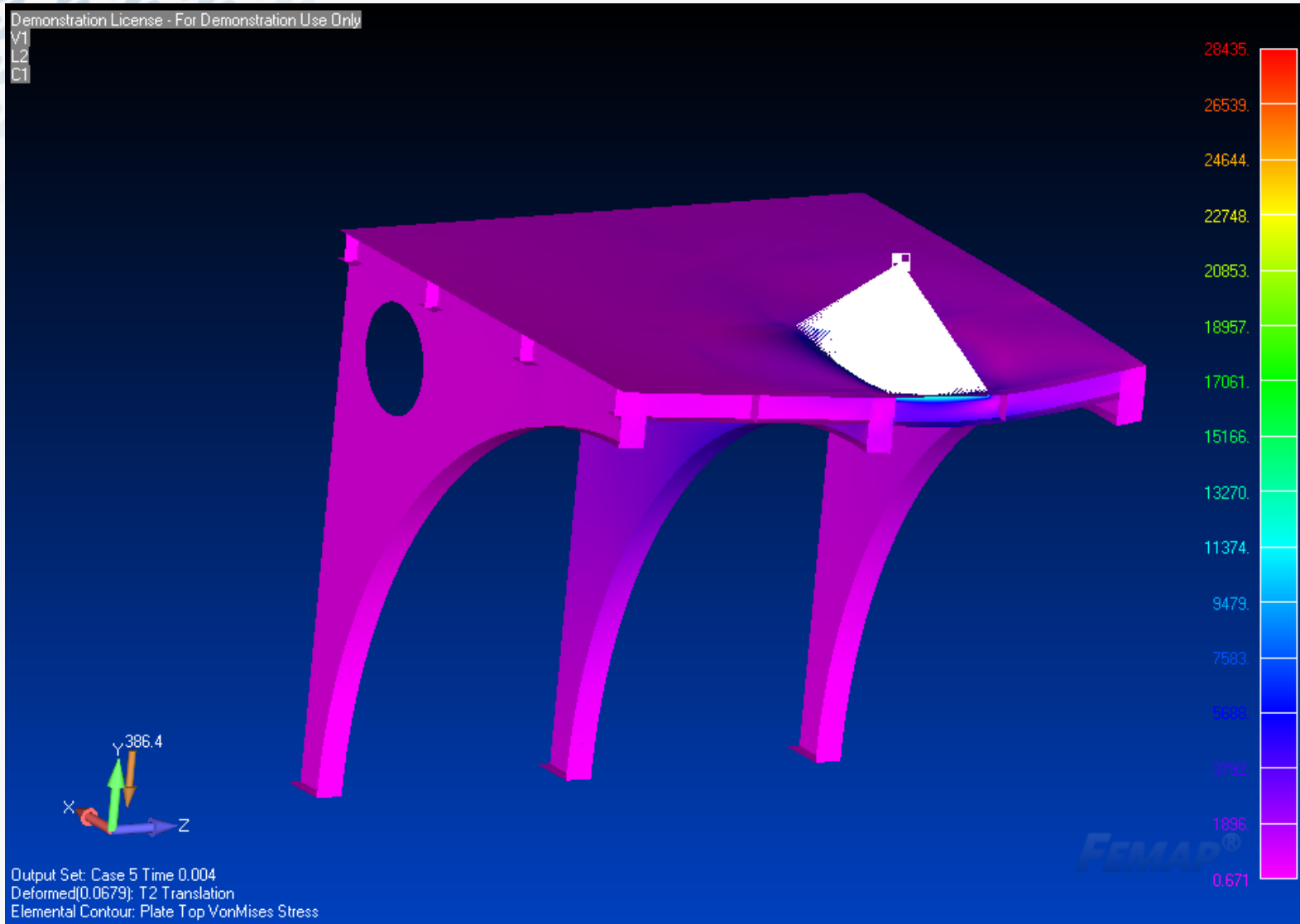
- ★ **Presentation**
- ★ **Demonstration**
- ★ **Conclusion**
- ★ **Q&A**
- ★ **Next Steps**

# Impact Loads

- **Analyzing impact loads will require NX NASTRAN transient solution**
- **More complicated solutions will require NX NASTRAN Nonlinear Transient solutions**
- **For this webinar, we will use flexible structure for impact**
- **We will model the interface using RBE3 and CBUSH**
- **We will run a Linear and Nonlinear Transient to simulate contact conditions**

- **Demonstrated Impact Analysis using Rigid Element (REB2 and RBE3)**
- **Transient Solution (Sol 109) with Initial Condition and Gravity**
- **The Initial Condition is the velocity at impact**

$$V = at + V_0$$

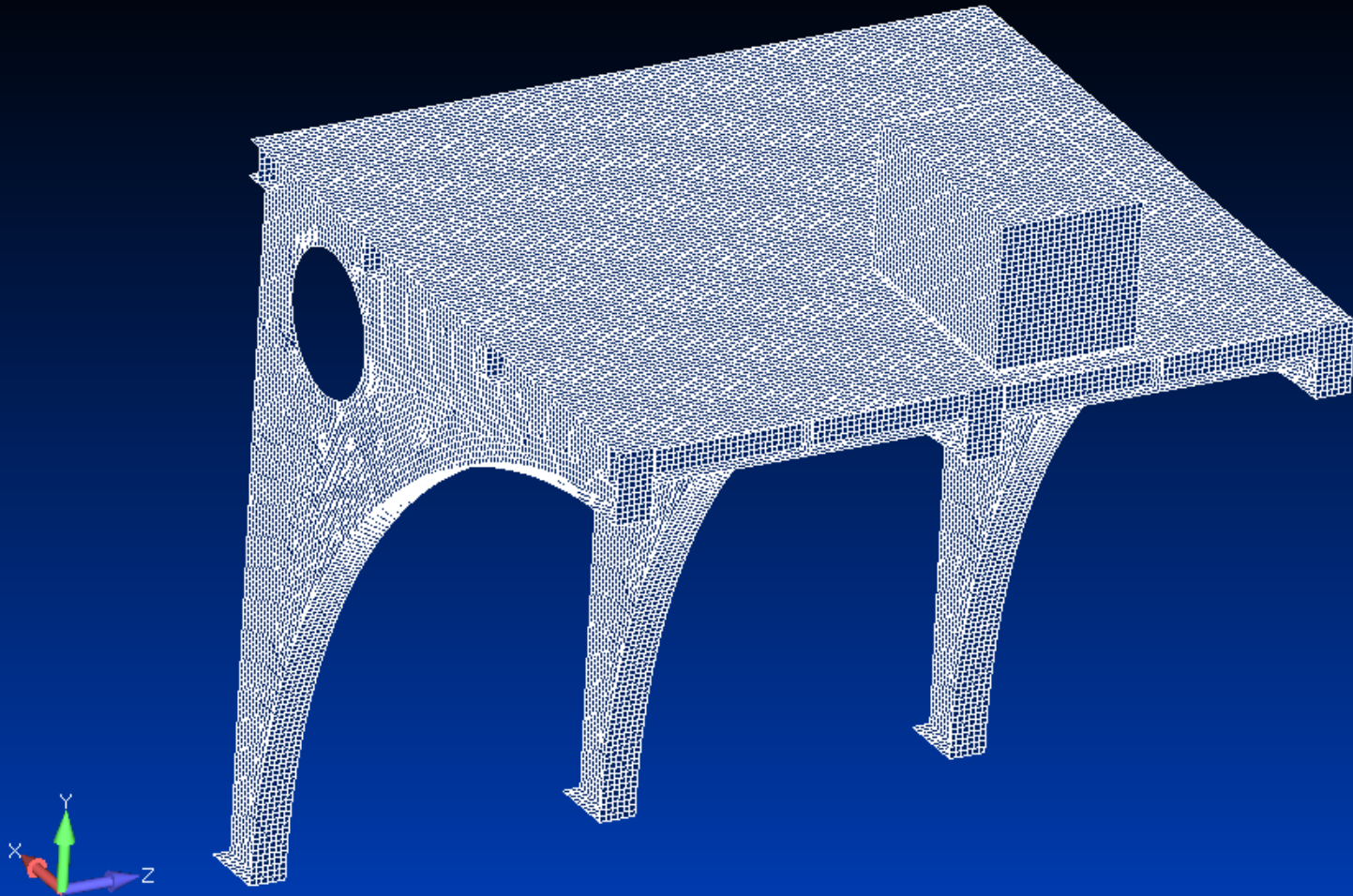




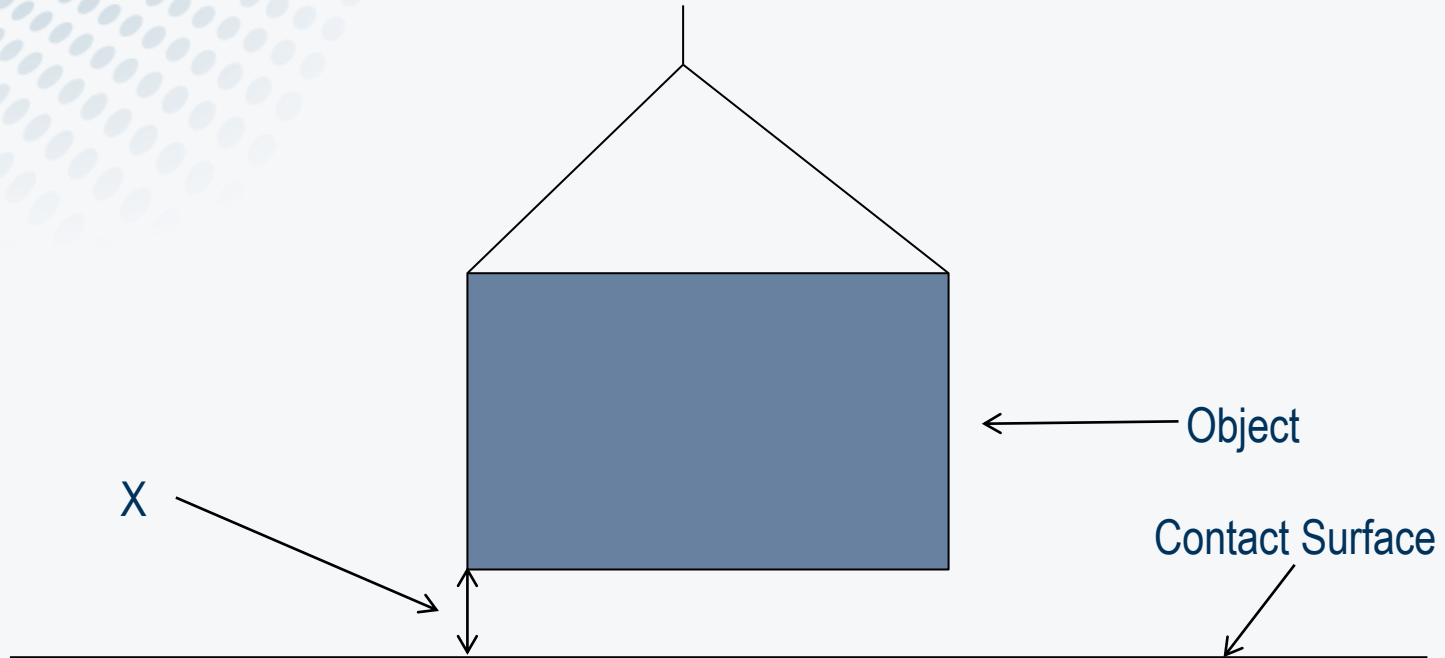
# Today's Webinar

Demonstration License - For Demonstration Use Only

V1  
L2  
C1



# Determining Initial Condition



$$Acel=32.2*12 \quad X=1 \quad Vel=0$$

# Determining the Initial Conditions



$$Acel = 32.2 * 12$$

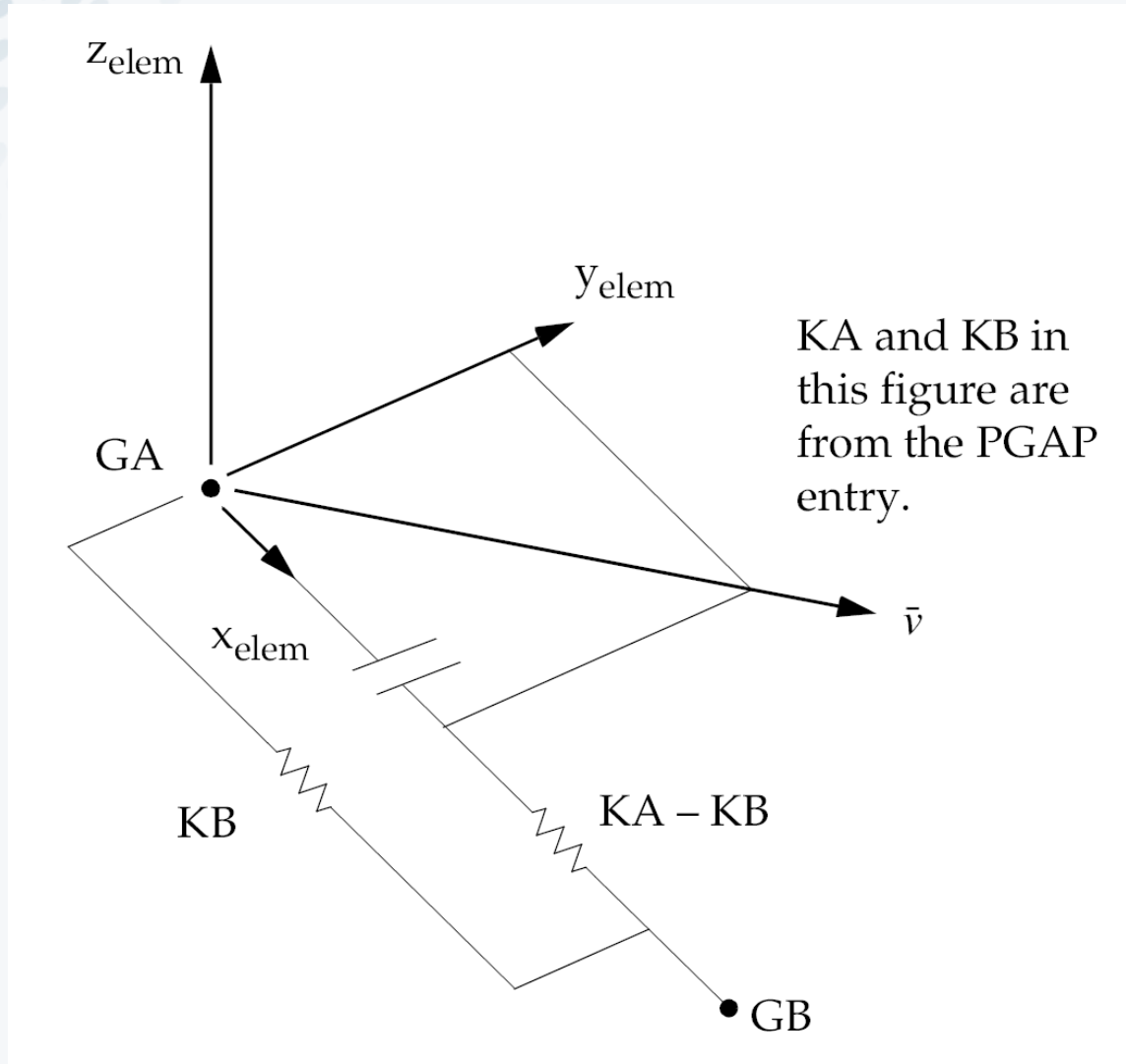
$$X = 0$$

$$v^2 = v_0^2 + 2a(r - r_0)$$

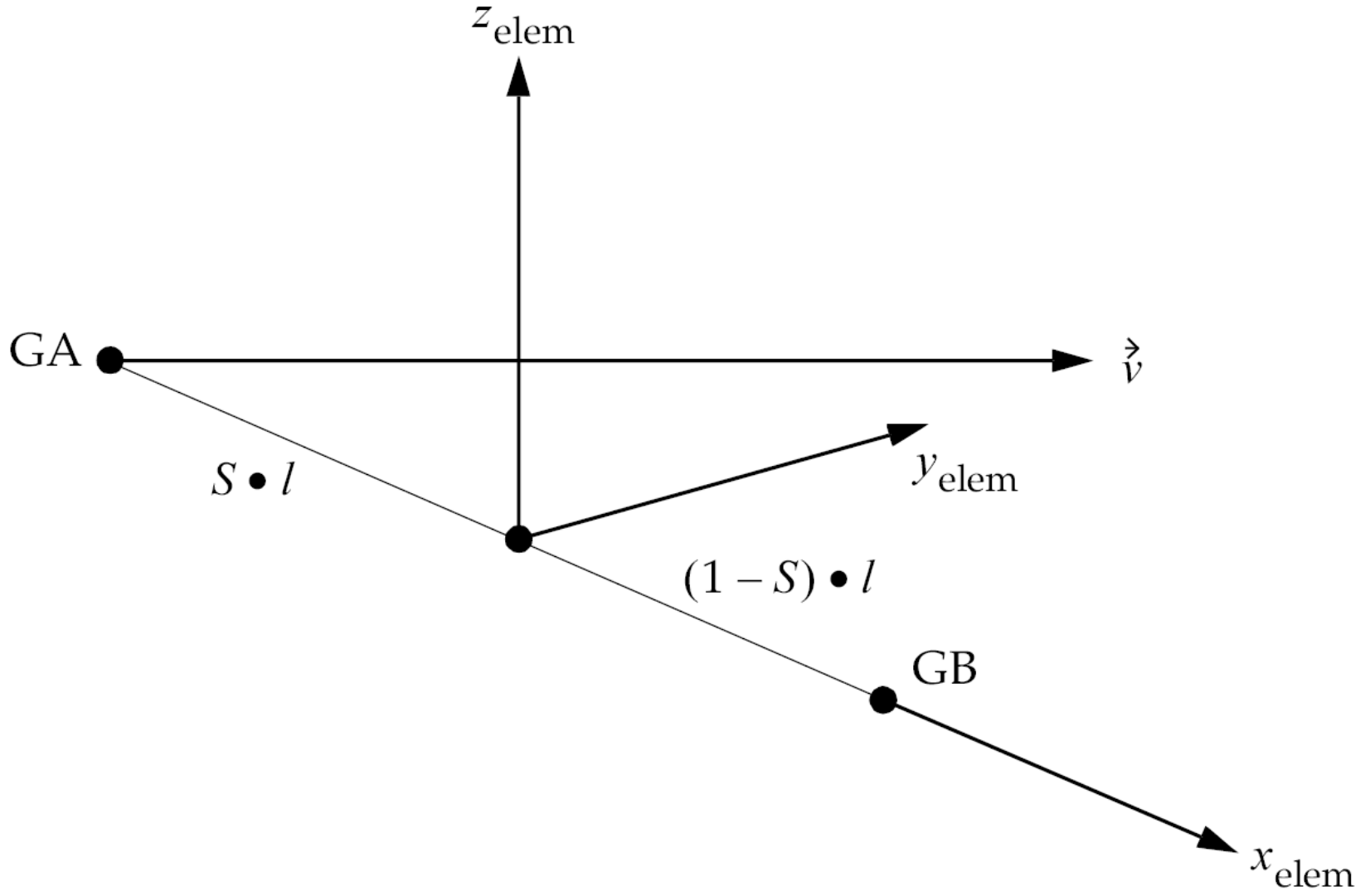
$$Vel = \text{sqr}(0 + 2 * 32.2 * 12(1 - 0)) = 27.8 \text{ in/sec}$$

- **Rigid Connection (RBE2 or RBE3).**
- **Springs (CBUSH)**
- **Contact (FEMAP)**

# CGAP Element Orientation



# CBUSH Element Orientation



- **Transient solutions with an initial condition will only run in a Direct solution**
- **This simulation modeled Box-Frame interface with Springs**
- **Because the Box did not separate, the Linear Transient Solution produced good results.**
- **However, higher stress are seen do to contact dynamics**
- **If the Box separated from the Frame during the simulation, Nonlinear would be the only solution**
- **One must fully understand NX NASTRAN dynamics to get good results.**

# Questions and Answers





For additional questions, one-on-one consultations or training, contact us at:

**Support Line: (949) 481-3267 x2001**

**or**

**[solutions@saratechinc.com](mailto:solutions@saratechinc.com)**



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# Thank You!

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