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Title: Northern New Mexico College Brown Bag Seminar

Author(s): Valdez, Lucas Marcos

Intended for: Brown Bag Seminar at NNMC

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Northern New Mexico College Brown Bag Seminar

Lucas M. Valdez
LANL/V&M Global Solutions LLC

UNCLASSIFIED

Early years

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- Attended Hernandez Elementary
- Attended Espanola Middle School

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 - Top 10 in class
 - Extracurricular activities

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- **Attended NNMC concurrently during junior and senior years**

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Figure 4. Density Tank CAD Model and Variables for Calculations

Area: $A_T = A_{Rec} + A_{SC} = hw + \frac{\pi r^2}{2} = 174.96 \text{ in}^2$

Volume: $V_T = V_{Rec} + V_{SC} = lhw + \frac{\pi r^2}{2}l = 4898.88 \text{ in}^3$

Water Capacity: $W_C = V_T * \left(\frac{1 \text{ gal}}{231 \text{ in}^3} \right) \approx 21.21 \text{ gal}$

Water Weight: $W_W = W_C * \left(\frac{8.33 \text{ lbs}}{1 \text{ gal}} \right) \approx 178.68 \text{ lbs}$

Center of Gravity: $l = \frac{wA_T}{2} = \frac{w(hw + \frac{\pi r^2}{2})}{2} = 6.25 \text{ in}^*$

* Distance from Top of Tank

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 &\quad * \text{ Distance from Top of Tank}
 \end{aligned}$$

- Applied knowledge and critical thinking skills developed in undergraduate studies to real-life problems or situations

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 - Worked on Measurement Uncertainty of manufacturing processes
 - Measurement System Analysis (MSA)
 - Statistical Process Control (SPC)

$$Y_{ijk} = \mu + \tau_i + \beta_j + (\tau\beta)_{ij} + \varepsilon_{ijk} \quad \begin{cases} i = 1, 2, \dots, a \\ j = 1, 2, \dots, b \\ k = 1, 2, \dots, n \end{cases}$$

$$\begin{aligned} \sum_{i=1}^a \sum_{j=1}^b \sum_{k=1}^n (y_{ijk} - \bar{y}_{...})^2 &= \sum_{i=1}^a \sum_{j=1}^b \sum_{k=1}^n [(\bar{y}_{i..} - \bar{y}_{...}) + (\bar{y}_{.j.} - \bar{y}_{...}) \\ &\quad + (\bar{y}_{ij.} - \bar{y}_{i..} - \bar{y}_{.j.} + \bar{y}_{...}) + (y_{ijk} - \bar{y}_{ij.})]^2 \\ &= bn \sum_{i=1}^a (\bar{y}_{i..} - \bar{y}_{...})^2 + an \sum_{j=1}^b (\bar{y}_{.j.} - \bar{y}_{...})^2 \\ &\quad + n \sum_{i=1}^a \sum_{j=1}^b (\bar{y}_{ij.} - \bar{y}_{i..} - \bar{y}_{.j.} + \bar{y}_{...})^2 \\ &\quad + \sum_{i=1}^a \sum_{j=1}^b \sum_{k=1}^n (y_{ijk} - \bar{y}_{ij.})^2 \end{aligned}$$

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 - Simulations for optimizing designs and uncertainty analysis
 - Scientific paper publications and patents
- **L. Valdez**, J. Ziegert, P. Schmidt, “*Uncertainty of In-process Roundness Measurement using the Multi-probe Error Separation Method*”, American Society for Precision Engineering, Austin, TX, (2015)
 - J. Ziegert, **L. Valdez**, P. Schmidt, M. Jones, T. Brakefield, 2015. Universal Rotor Measurement Gage. U.S. Patent Application 200000000000, (filed May 2015). Patent Pending.

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LANL: 2016-Present

- Hired on as FTE
 - Research and Development (R&D) Engineer
 - Member of several professional organizations (ASPE, SME, CMS, ASQ, etc.)
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 - Projects range from manufacturing processes of nuclear and non-nuclear work
 - Error and uncertainty budgets for manufacturing processes and equipment

Interactions - Inner Contour (100 Iterations)			
Error Source	Standard Deviation (um)	Mean Error (um)	Uncertainty (um)
CMM, Environment, Probe, Form	2.67	5.61	10.95
Environment, Probe, Form	2.97	5.79	11.73
CMM, Probe, Form	0.73	2.74	4.20
Probe, Form	0.68	2.49	3.85
CMM, Environment, Form	2.52	3.74	8.77
Environment, Form	3.34	4.49	11.18
CMM, Form	0.56	1.43	2.54
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CMM, Environment, Probe	3.03	7.04	13.09
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- Investigate additive manufacturing in non-nuclear work

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- Develop curriculums for operators

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- Built out of wanting to use more from knowledge gained and application of skills from experience

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Summary

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- Never settle for anything less than your best
 - Reach an expectation and exceed it!
- Anything you want to accomplish can be done with hard work and determination

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Questions?

Lucas M. Valdez

Email: valdezlucas25@gmail.com

Phone: (505) 927-5397

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