

**Independent Chemical Consulting:**  
**The Triumph of Science Over the Bureaucracy**

**“Leveraging Your Expertise to Generate  
Business as a Chemical Consultant”**

**Seminar at the Chem Show**

**Jacob Javits Center – New York City**

**November 18, 2015**

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## **Mission Statement:**

- **The Application of Fundamental Chemical Principles to Solve Problems.**

## **Vision Statement:**

- **To Solve Problems That Aren't in Any Book.**

## **Business Objective:**

- **Have I Applied My Specialized Knowledge to Help Others Who Under Other Circumstances Wouldn't Be Able to Help Themselves?**

# Independent Chemical Consulting: The Triumph of Science Over the Bureaucracy

## Keys to Success:

- **Always Respect Your Client**
- **Always Tell Your Client the Truth**
- **Be Fair in Billing**

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## Getting Started:

- **The Concept (What Do You Want to Do?)**
- **Obtain Legal & Accounting Advice/Guidance**
- **Be Passionate/Believe in What You're Doing**

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- **I can no longer blame the boss.**
- **Pick the 60 hours of work each week.**
- **Importance of “lyrics” and “music.”**

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- **Think Outside of the Box.**
- **All Knowledge is Relevant.**
- **Embrace Serendipity.**



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**U.S. Department of Labor (DOL)**  
**Energy Employees Occupational Illness**  
**Compensation Program Act**  
**or EEOICPA**

**(Enacted by Executive Order in 2000)**

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**Part B – Primarily for employee cancers caused by exposures to ionizing radiation in the federal nuclear weapons complex. Compensation is \$150,000.**

**Part E – Primarily for chemically-induced illnesses in exposed workers in the federal nuclear weapons complex. Compensation is up to \$250,000.**

**Both Parts offer a medical card for the covered illness.**

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- Three reversed (**Denied to Accepted**) Part E Claims:
  - Chemically-induced cerebellar ataxia at the Mound Plant (**near Dayton, OH**).
  - Radiation-induced blood clotting disease at the Fernald Plant (**near Cincinnati, OH**).
  - Radiation-induced benign brain tumor at the Iowa Army Ammunition Plant (**Middletown, IA**).

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**In the Mound Claim, the Employee worked as a Custodian, Demolition Technician, and in the Laundry.**

**Exposure to the solvent trichloroethylene (C<sub>2</sub>HCl<sub>3</sub>) was determined by the Employee's personal physician and me to have caused the ataxia (crippling disease).**

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Table I	H-Building	HH- Building	R-Building	SM-Building
Trichloroethylene	Present	Absent	Present	Present

Table II	SW-Building	T-Building	WD-Building
Trichloroethylene	Present	Present	Present

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**In a study of 50 workers employed from 1 month to 15 years in various industrial cleaning and degreasing operations using TCE, complaints due to chronic exposure included decreased appetite, sleep disturbances, ataxia, vertigo, headache, short-term memory loss, and a reduced number of word associations. Greater frequency of symptoms was noted in workers exposed to higher (85 ppm) than lower (14 ppm) mean TCE concentrations.**

<http://www.atsdr.cdc.gov/HEC/CSEM/tce/docs/tce.pdf>

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**According to the National Health Service (NHS)  
in the United Kingdom:**

**“certain toxic chemicals, such as mercury and  
some solvents – these can trigger ataxia if a  
person is exposed to enough of them.”**

<http://www.nhs.uk/Conditions/Ataxia/Pages/Causes.aspx>

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The Fernald Claimant worked in the chemistry laboratory there. He often handled samples that were unidentified and unlabeled.

Many of these samples contained highly enriched uranium (HEU). Highly enriched uranium can contain ca. 95% uranium-235, an alpha ( $\alpha$ ) and a gamma ( $\gamma$ ) emitter.



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The Claimant was diagnosed with Deep Vein Thrombosis (DVT) and Pulmonary Embolism (PE).

According to the National Institutes of Health (NIH):

**“DVT is a blood clot that forms in a vein deep in the body. Blood clots occur when blood thickens and clumps together.**

**Most deep vein blood clots occur in the lower leg or thigh. They also can occur in other parts of the body.**

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**A blood clot in a deep vein can break off and travel through the bloodstream. The loose clot is called an embolus. It can travel to an artery in the lungs and block blood flow. This condition is called PE.**

**PE is a very serious condition. It can damage the lungs and other organs in the body and cause death.”**

<http://www.nhlbi.nih.gov/health/health-topics/topics/dvt/>

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**In the Claimant's situation, he had a condition known as Factor V Leiden. Per the NIH:**

**“Your blood is thicker or more likely to clot than normal. Some inherited conditions (such as Factor V Leiden) increase the risk of blood clotting.”**

<http://www.nhlbi.nih.gov/health/health-topics/topics/dvt/causes>

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**Blood Clotting is a multi-step process. This process stops “normally” in people who don't have Factor V Leiden.**

**In patients who have Factor V Leiden, the gamma radiation actually impacts the steps in this process. As a result, blood clotting does not stop and large internal clots can form.**

**The Claimant's physicians independently came to the same conclusion as I had reached.**

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**Claimant at the Iowa Army Ammunition Plant had a benign brain tumor known as Meningioma.**

**EEOICPA under Part B will compensate the Claimant for a malignant tumor, but not for a benign tumor.**

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**The Claimant dismantled nuclear warheads that contained ca. 95% by mass the uranium-235 isotope.**

**This Claim had been denied on the basis that the radiation from the uranium-235 isotope was not sufficient to cause Meningioma.**

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**The key to success in this Claim was recognizing that the mass balance (the remaining 5%) had not been determined.**

**The process of separating the uranium-235 isotope from the more common uranium-238 isotope also enriches the other lighter isotopes.**

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One of these lighter isotopes important here is **uranium-234**. In HEU, there will be ca. 1% to 2% uranium-234.

**Uranium-238: 92 Protons + 146 Neutrons**

**Uranium-235: 92 Protons + 143 Neutrons**

**Uranium-234: 92 Protons + 142 Neutrons**

The specific activity of uranium-234 renders this isotope to be at least 3,000 times more radioactive than uranium-235. As a result, the majority of the radiation in HEU comes from the uranium-234.



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The Claimant's radiation exposure was considered by the Department of Labor to be less than 1 REM. This low level from the uranium-235 isotope was the basis for the Claim Denial.

At the Claimant's hearing, I testified that the exposure from the uranium-234 isotope was about 500 REM. My rationale was that the exposure had to be sufficient enough to cause the Meningioma, but not high enough to kill the Claimant (ca. 800 REM).

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## Concluding Thoughts:

All three of these Claims were reversed from Denied to Accepted status after a hearing was held. It is very difficult to get such Claims Accepted.

Those who presided over these hearings were not required to have medical or scientific knowledge.

Such Claims are often without precedent in the EEOICPA. As a result, I know how important it is “to educate” the individual presiding.

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**Acknowledgement:**

Deborah Cate of MC<sup>2</sup> does a great job in preparing presentation slides and in ensuring that the layout of our publications always looks sharp.

# On-Going Work

## Our current work is focused in:

- Chemical Consultations/Process Improvement
  - Expert Witnessing in the Physical Sciences
- Chemical Release/Explosion/Fire Investigations
- Automobile and Truck Accident Investigations
  - Insurance Subrogation Cases
- Nuclear Chemistry Issues (including **Energy Employees Occupational Illness Compensational Program Act Claims**)
- HUBZone Distributor of Chemicals and Supplies for ThermoFisher Scientific, L.L.C.

**Making a difference for our clients is our only goal.**