Lifetime of Learning

There Is Always Something To Learn

My Success

* I am still learning to be: Technically Competent
* My early years –I learned chemistry and microbiology
* My 20's and 30's – I learned to manage people and a business
* My 40's and 50's - I learned to audit and perform assessments (helped others to learn how to manage their businesses)
* NOW - teaching others what I have learned over the years and still learning –
  * **BECAUSE THINGS ALWAYS CHANGE !!**

My First Training

* I took a training course at the YWCA for being a babysitter
* I then started taking care of five boys and one girl

I passed the class and you were given an identification card with picture – I was certified as a babysitter

I was ten (10) years old

Learning to Lead

* I lead a group of early teens
  * See I'm supervising
  * Yes it was the 60s so the style of dress was different
* Together we set up a youth center in my community

How Did I Get Here?

* In high school, (it was the early 70s) a chemistry teacher inspired me to learn more about chemistry
* The environmental movement started at about the same time
* I went to work in a laboratory that was testing water, soil, and a variety of materials such as steam condensate for a variety of contaminants
* I collected and analyzed samples during those years
* We did science!

The Early Years

* The lab grew with the environmental program
  * I learned how to test a variety of materials
* Laws were passed and our chemical industry clients needed to comply with those new laws.
  * I learned how to do regulatory science
* What is regulatory science?
  * It is what we do in the environmental laboratory

Science

* SCIENCE (from Latin *scientia*, meaning "knowledge") is **a systematic enterprise** that builds and organizes knowledge in the form of testable explanations and predictions about the universe.
* We did science in the early days of the environmental movement.
* We wanted to determine what was in the environment
* The regulations enacted told us how to do science
* However- Every agency still wants science to give the exact answer
  * Remember in the scientific method the outcome is an estimate of the true value and NOT the exact value.

Regulations

* In government, typically a regulation specifically means a piece of the delegated legislation drafted by subject matter experts to enforce a statutory instrument (primary legislation)
* Regulations of various government agencies (a form of delegated legislation) are issued by those agencies having jurisdiction or responsibility over, or in response to statutes of Congress directing them to take responsibility over a particular subject or issue.
* They are published in the Federal Register for public notice and comment before becoming valid, and unless objected to by Congress, become effective and have the force and effect of law.

Science In Regulation

* In the environmental testing world, it is science performed according laws and regulations of the country or state
* It is not pure science but attempts to do science in a very consistent manner
  * Everyone treated equally so everyone is tested the same way (Not really pure science)
  * Following the same method makes the science more consistent (Really?)
  * No longer a systematic enterprise for building knowledge
  * Does not always ensure data are correct for making the decision

The Early Lab Years

* I grew up with the lab and in the late 80s I was Vice President running not only the technical side of the business but the financial side as well.
* Negotiating loans with the banks for new equipment (e.g. GC/MS ¼ million dollars each) but also getting new clients and adding new technologies and areas of expertise
* I learned the business as a scientist.
* I learned the business from doing it and learning the practical approach to operating a scientific business. (Applied science **not** theoretical)

By the Way

* I partially left the industry
* I started a business in 1984 that was not related to environmental regulatory science
* It was computer business consulting
* I helped all types of businesses use these new fangled machines to do their accounting
* I learned that all businesses require management to use a systemic enterprise

Environmental Laboratory

* I came back to the environmental lab full time in 1988
* I managed a captured drinking water laboratory
* We were performing Regulatory Science
* Producing High Quality Data (wasn't everyone?)
* We produced data to meets the needs of ourclients (customers)
  * Who is the customer of the Environmental Laboratory?
  * Person/Organization that pays the bill
  * The local, state or federal agency
  * If a captured lab - the plant manager, superintendent or some else in management

The Beginning of a National Program

* In the late 80s a group of labs started the movement towards one set of criteria for all environmental labs
* There were so many regulations by this time
* A small lab had a difficult time competing
* There was always a "gotcha"
* Audits done by states and clients for multiple programs
* I was working in about four states and we had at least one audit a month and we ran about one PT per month.
* We needed the industry to get back to science

The Coalition - 1990

In recognition of the need for a **National Environmental Laboratory Accreditation** program, the International Association of Environmental Testing Laboratories (IAETL) has organized a committee for the express purpose of promoting the formation of this program. It is fully recognized that this is not an easy task; however, its formation offers numerous benefits to all members of the environmental community.

The following is a listing of participants as of April 23, 1990 in the effort to form a National Environmental Laboratory Accreditation Coalition.

A2LA
A2LA
Artesian Laboratories, Inc.
BASF Corporation

Chemical Waste Management, Inc.
CompuChem Laboratories, Inc.
Corning, Incorporated
Enseco, Inc.
Enseco, Inc.
Enseco, Inc.
Environmental Testing and Certification, Inc.
Environmental Testing and Certification, Inc.
Environmental Science & Engineering, Inc.
Envirosystems, Inc.
Hackensack Water Company
Hagar Laboratories, Inc.
Industrial & Environmental Analysts, Inc.
Industrial & Environmental Analysts, Inc.
Lancaster Laboratories, Inc.
Lancaster Laboratories, Inc.
NET, Inc.
Recra Environmental, Inc.
Roy F. Weston, Inc.
Structure Probe, Inc.
U.S. Army Envir. Hygiene Agency
VERSAR, Inc.
Viar and Company
Wadsworth/Alert Laboratories, Inc.
Water Control Laboratory
Wilson Laboratories
WMI Environ. Monitoring Laboratories

Mr. John W. Locke
Ms. Roxanne Robinson
Ms. Marlene O. Frey
Dr. Kathy J. Dien Hillig, Ph.D.
(also representing CMA)
Dr. E. Scott Tucker, III
Mr. Robert E. Meierer
Ms. Carolyn Kim McCarthy
Ms. Margaret Sleevi
Ms. Kathy Carlberg
Mr. John E. Farrell, III
Mr. James A. Ploscyca
Mr. Kenneth Hebel
Dr. John J. Mousa
Dr. Mohan Khare, Ph.D.
Mr. Louis A. Briganti
Ms. Gretchen S. Heuring
Mr. Frederick Doane
Mr. Mark Randall
Dr. Wilson Hershey, Ph.D.
Ms. Louise Hess
Mr. Richard S. Leonard
Mr. Robert K. Wyeth
Dr. Richard J. Ronan
Dr. Andrew W. Blackwood
Mr. Timothy L. Fisher
Dr. Charles W. Carter, Ph.D.
Ms. Anne Babyak
Dr. Marvin W. Stephens, Ph.D.
Mr. James C. Todaro
Ms. Sharon Bruce
Ms. Barbara R. Hill

We are seeking your input and participation. If you are interested in this effort and would like to receive more information, please complete and return the enclosed form. We look forward to adding your name to this list of participants in the future.

Thank you for your attention to this matter.

National Environmental Laboratory Accreditation Coalition

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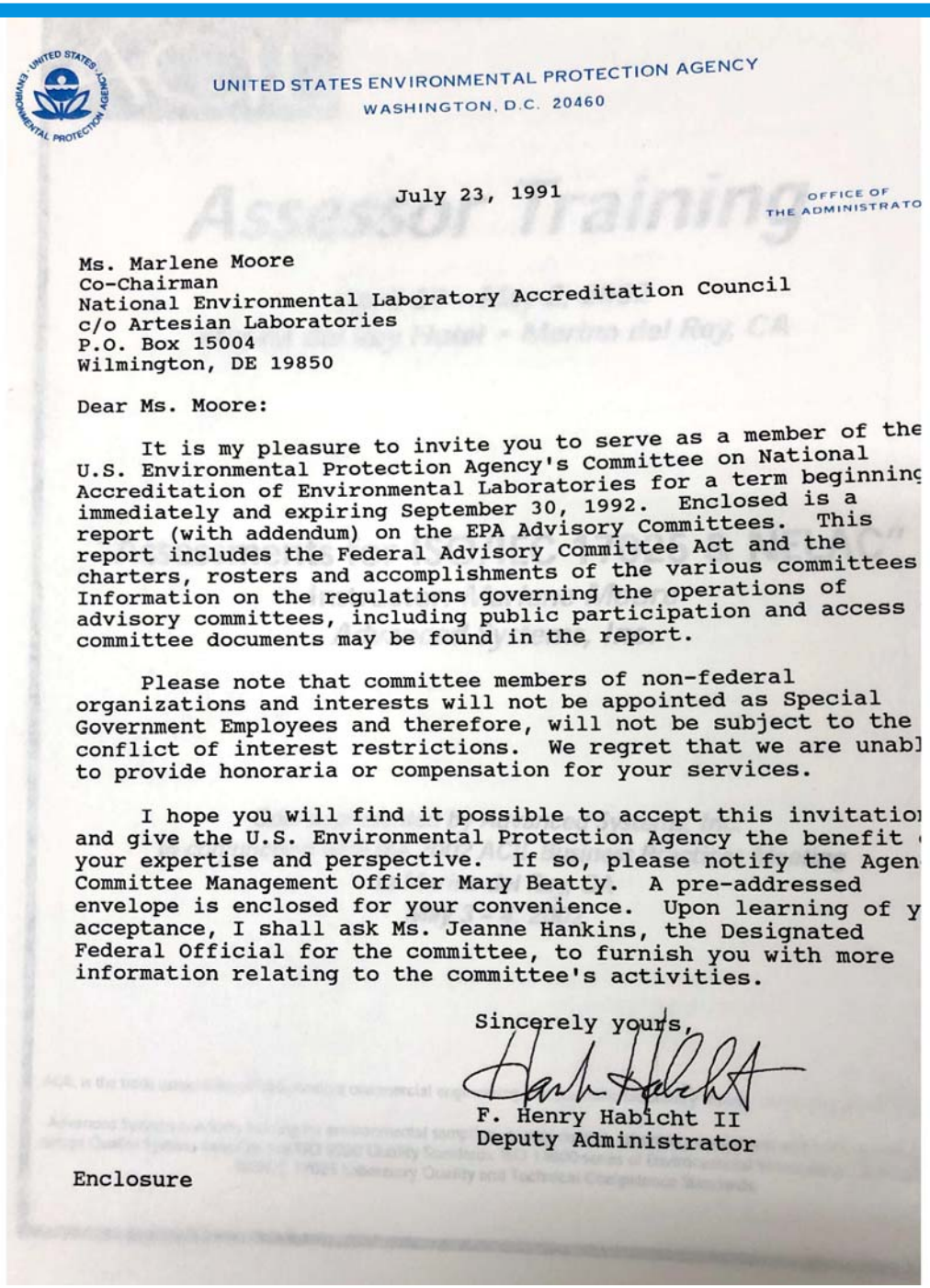
NELAC is Born

* The National Environmental Laboratory Accreditation Coalition (NELAC) went to EPA to request a single national program.
  * I became the co-chair of NELAC and the meetings were held at the laboratory in Delaware (The first state!)
* The committee for National Accreditation of Environmental Laboratories was formed (CNAEL) by EPA
  * I served as the small lab representative on CNAEL a FACA
* The report from this committee started this movement and we are now all part of - The NELAC Institute (TNI)



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

July 23, 1991

OFFICE OF
THE ADMINISTRATO

Ms. Marlene Moore
Co-Chairman
National Environmental Laboratory Accreditation Council
c/o Artesian Laboratories
P.O. Box 15004
Wilmington, DE 19850

Dear Ms. Moore:

It is my pleasure to invite you to serve as a member of the U.S. Environmental Protection Agency's Committee on National Accreditation of Environmental Laboratories for a term beginning immediately and expiring September 30, 1992. Enclosed is a report (with addendum) on the EPA Advisory Committees. This report includes the Federal Advisory Committee Act and the charters, rosters and accomplishments of the various committees. Information on the regulations governing the operations of advisory committees, including public participation and access to committee documents may be found in the report.

Please note that committee members of non-federal organizations and interests will not be appointed as Special Government Employees and therefore, will not be subject to the conflict of interest restrictions. We regret that we are unable to provide honoraria or compensation for your services.

I hope you will find it possible to accept this invitation and give the U.S. Environmental Protection Agency the benefit of your expertise and perspective. If so, please notify the Agency Committee Management Officer Mary Beatty. A pre-addressed envelope is enclosed for your convenience. Upon learning of your acceptance, I shall ask Ms. Jeanne Hankins, the Designated Federal Official for the committee, to furnish you with more information relating to the committee's activities.

Sincerely yours,

F. Henry Habicht II
Deputy Administrator

Enclosure

Moving Ahead

* It's the 90s
* I know how to do regulatory science
* But I never really learned how to manage people and a business
  * I did it and thought I was GREAT
  * UNTIL I learned about ISO in 1993. (Lead Auditor Training)
  * I learned that all business and personal growth was a systematic process
  * I learned ISO and ASQ principles and how to apply them
  * These concepts were added to my personal growth
  * I help others to implement these concepts in their business
* AND IT WAS GOOD!

Charlie Connection

* I met Charlie Carter at those meetings of NELAC (Coalition)
* In the 90s, Charlie worked as a subcontractor to Advanced Systems for about 1 year
* He performed Navy audits with me while exploring other ways he could help the environmental community
* He audited labs and we got to know each other during that year
* We were both considered competent based on different experiences in the same industry
* We learned from each other

Charlie Connection

* After that he went back to work for a large laboratory network
* We worked for the same ideals
  * Bettering the laboratory community using science
  * Ensuring we have one set of requirements for doing measurements
  * Attempting to improve the understanding of data users

Management

* I learned to manage by experience
* I learned bookkeeping and finance (the basics) by taking some classes and learning from accountants, lawyers, and managers (some good and some not so good)
* I learned how to run a business working for a small company and then starting a business or two of my own
* I often was told that I did not know what it took to run a large business.
* I have performed assessments of small businesses and very large multi-national corporations. These are not all laboratories.
* The systems are different in a large laboratory and small,
  * No matter the size they all need to be managed

How

* The fundamental management process
* Plan
* Do
* Check
* Act
* The systematic process of management and science
* Everyone learns the scientific method
* It can be applied to management and science!!

Quality System or Management System

* **Quality System:** A structured and documented management system describing the policies, objectives, principles, organizational authority, responsibilities, accountability, and implementation plan of an organization for ensuring quality in its work processes, products (items), and services. The quality system provides the framework for planning, implementing, and assessing work performed by the organization and for carrying out required quality assurance (QA) and quality control (QC) activities.

Quality Assurance

* **Quality Assurance:** An integrated system of management activities involving planning, implementation, assessment, reporting, and quality improvement to ensure that a process, item, or service is of the type and quality needed and expected by the client.
* QA in the project, permit, purpose for the testing
  * It is not the test alone!
  * The design ensures the QA, QC is correct for the decision
  * Every project, permit and design is unique

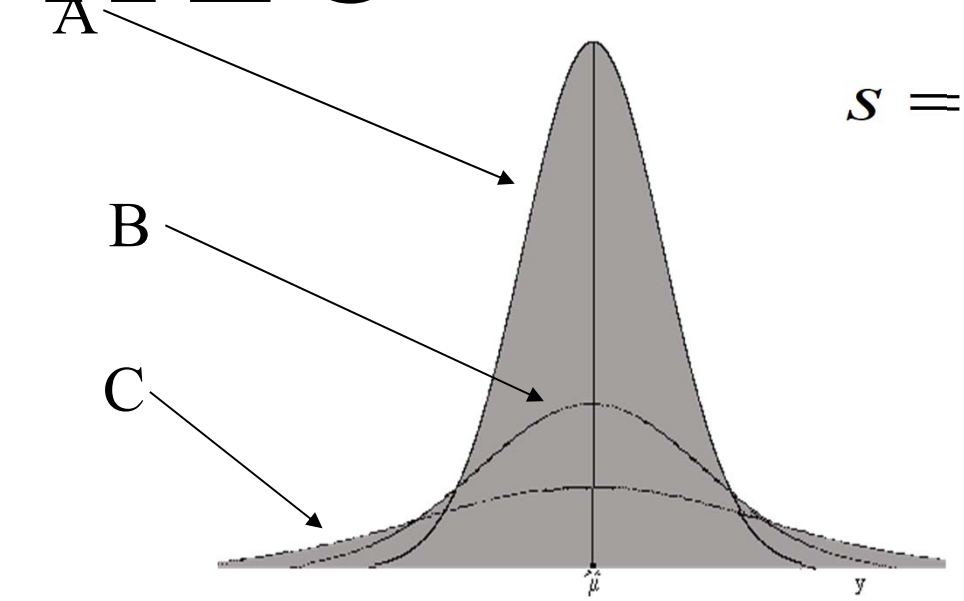
Mathematics

$$\bar{x} = \sum_i x_i / n$$

$$\overline{\overline{X}} \pm U$$

95% confidence level, k- 2

$$s = \sqrt{\sum (x - \bar{x})^2 / (n-1)}$$



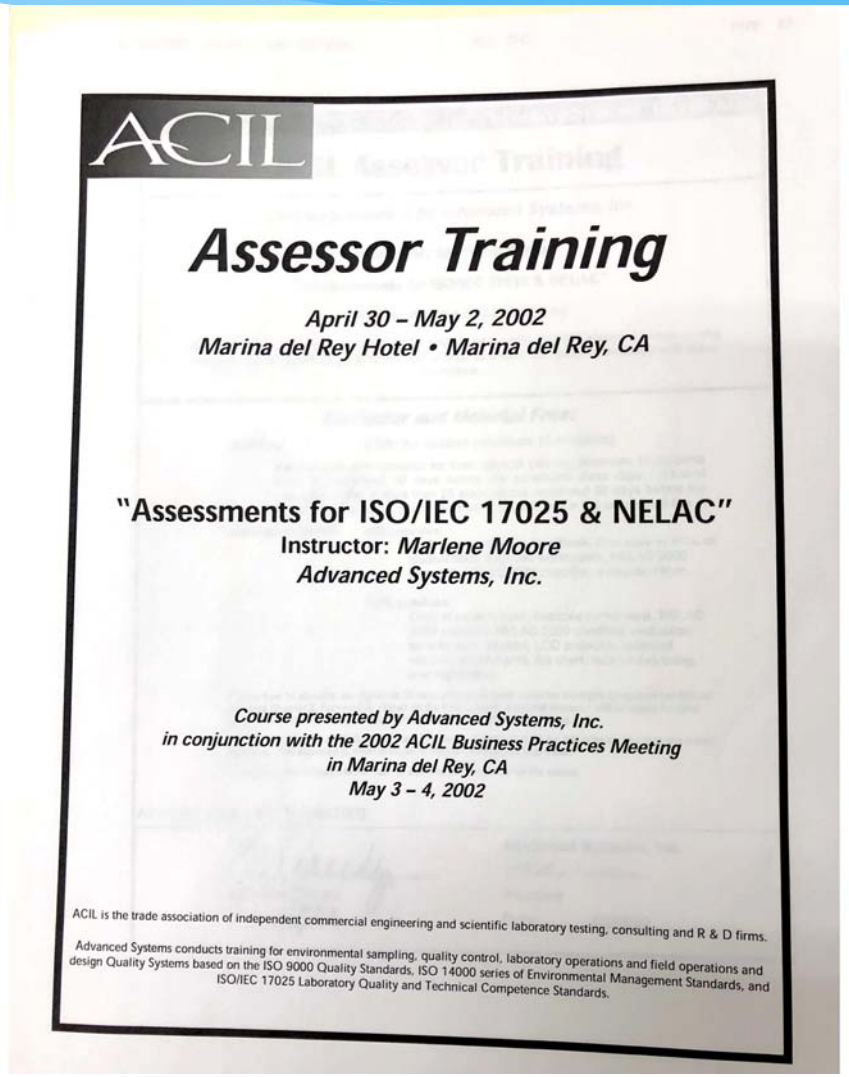
$$SE = s / \sqrt{n}$$

$$s / \bar{x}$$

Learning to Teach

* I learned chemistry, microbiology, management, business, finance, auditing, assessing and training.
* I started doing training with the Navy and that is when I realized people liked my training.
* I trained on materials I was given and told I had to use those materials. On the first day, I could tell they didn't like the class. I asked them if I could change the materials for the next day
* I did and the class seemed to really like the revisions and the way I presented the materials. (I was teaching engineers regulatory science) That is what started me on the path to teaching others full time.

Assessor Training



ACIL

Assessor Training

April 30 – May 2, 2002
Marina del Rey Hotel • Marina del Rey, CA

"Assessments for ISO/IEC 17025 & NELAC"
Instructor: *Marlene Moore*
Advanced Systems, Inc.

Course presented by Advanced Systems, Inc.
in conjunction with the 2002 ACIL Business Practices Meeting
in Marina del Rey, CA
May 3 – 4, 2002

ACIL is the trade association of independent commercial engineering and scientific laboratory testing, consulting and R & D firms.

Advanced Systems conducts training for environmental sampling, quality control, laboratory operations and field operations and design Quality Systems based on the ISO 9000 Quality Standards, ISO 14000 series of Environmental Management Standards, and ISO/IEC 17025 Laboratory Quality and Technical Competence Standards.

Science and Management

* You learn science by education and experience
* Applying the science to testing
* You learn management by experience and maybe education. Most lab managers are not MBA's They have PhDs, masters or bachelor degrees in a scientific field
* So how did they learn to manage: finances, people, the organization and the science?

Consulting Chemist

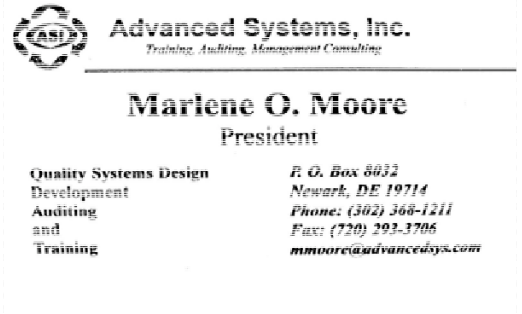
* I learned from a PHD chemist that was retired from DuPont. He taught me about ISO/EC Guide 25. He encouraged me to become an assessor after leaving the lab and attempting to be a consulting scientist.
* There is no business for a consulting chemist or microbiologist without a lab.
* An engineer does all consulting without a lab so why not a chemist?
* Its because we are never certain of anything

Consulting

* I learned from an engineer that data tells you something. While working in the lab I realized 'data talks to you' if you listen. You must run sufficient QC in order to hear what the data is telling you.
* Is it the method, sample or other influence in the test
* BTW I am now talking about uncertainty (UGH!)
* Something causes the variability in the data we produce
* As labs we must have the data to prove the variability is not from the lab, but form other external influences, such as sample collection, the material analyzed and the method selected by the client

Can We Be Certain

* The scientist must know what the contributors are to the variability in the data (sample, method, equipment, etc.) What influences the testing?
* We are taught in school that we must use the right equipment to do a measurement. You can use a wooden ruler, steel ruler, tape measure or caliber to measure length. The resolution influences the outcome
* We must be certain about our test. We must know the variability of the result. (This is not how current regulations are written) So how do you do science and regulation?



Don't Stop

* Learning from Others
* Teaching Others
* Striving to Achieve Technical Competence