

A Career in Corrosion Control

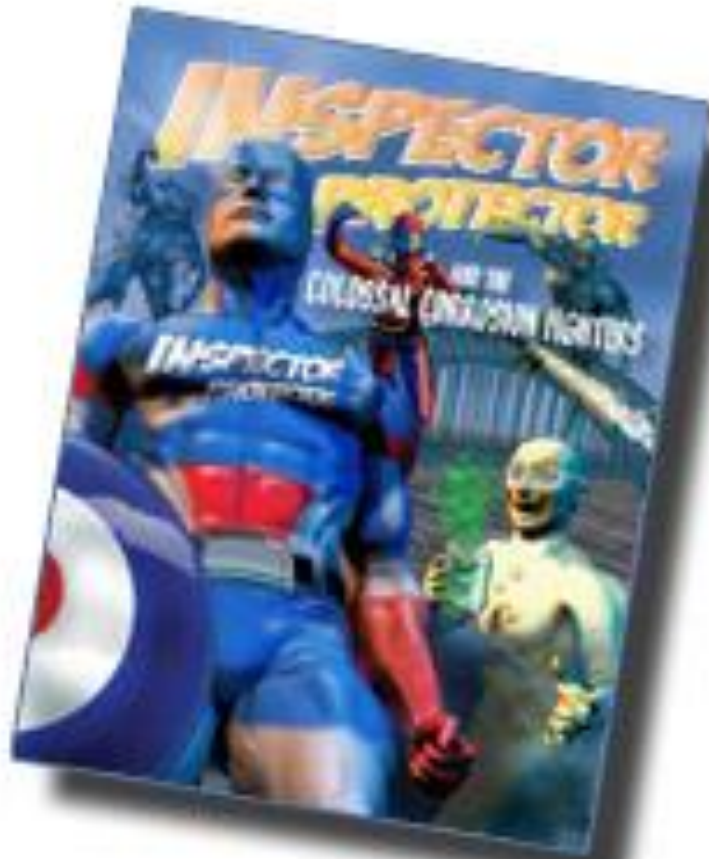
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NACE Houston Section

August 12, 2014

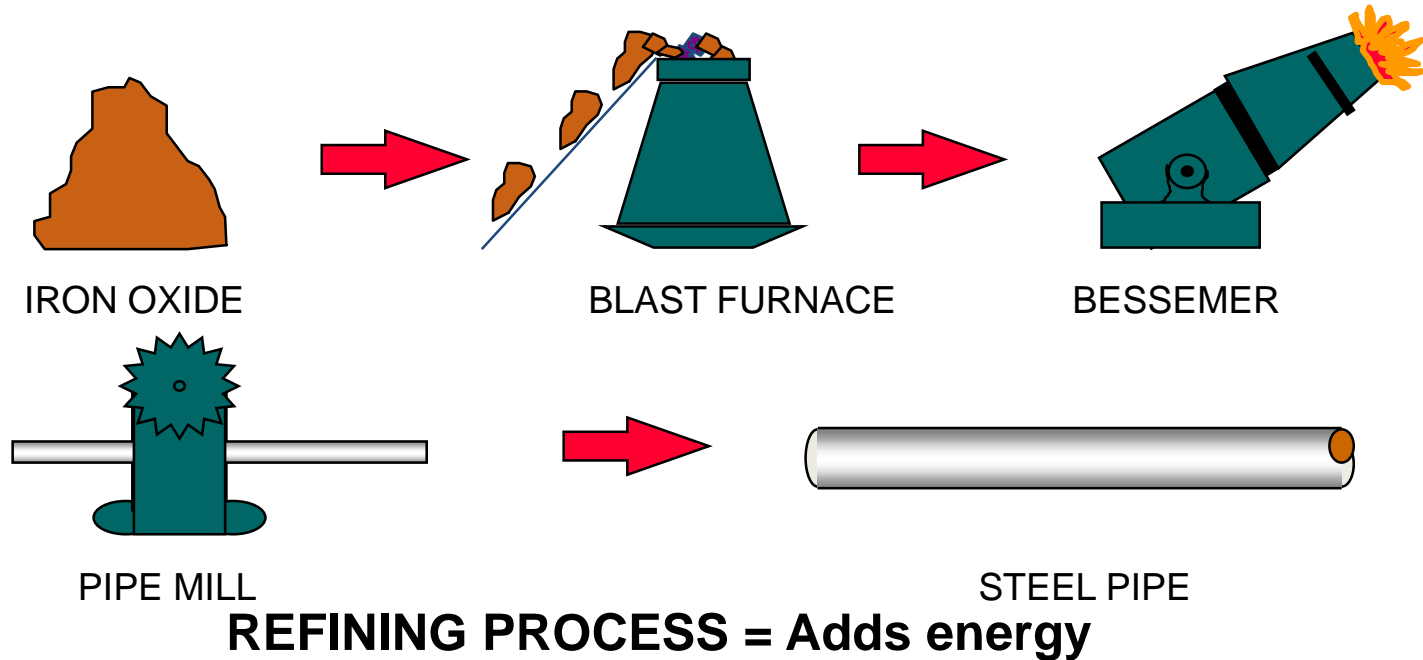
Inspector Protector and the Colossal Corrosion Fighters



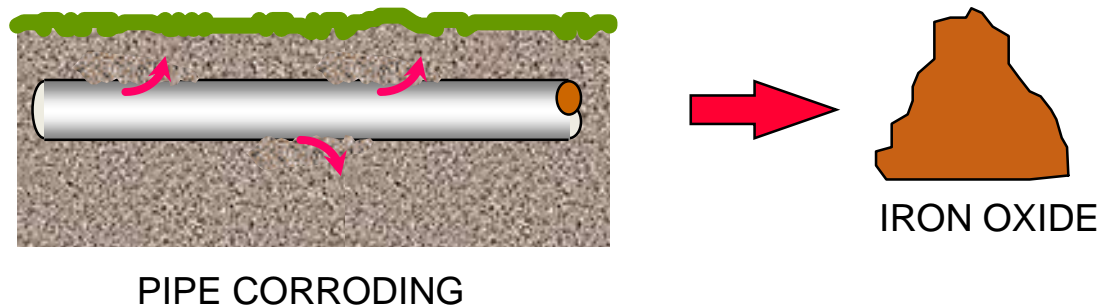
A Career in Corrosion Control

WHAT IS CORROSION?

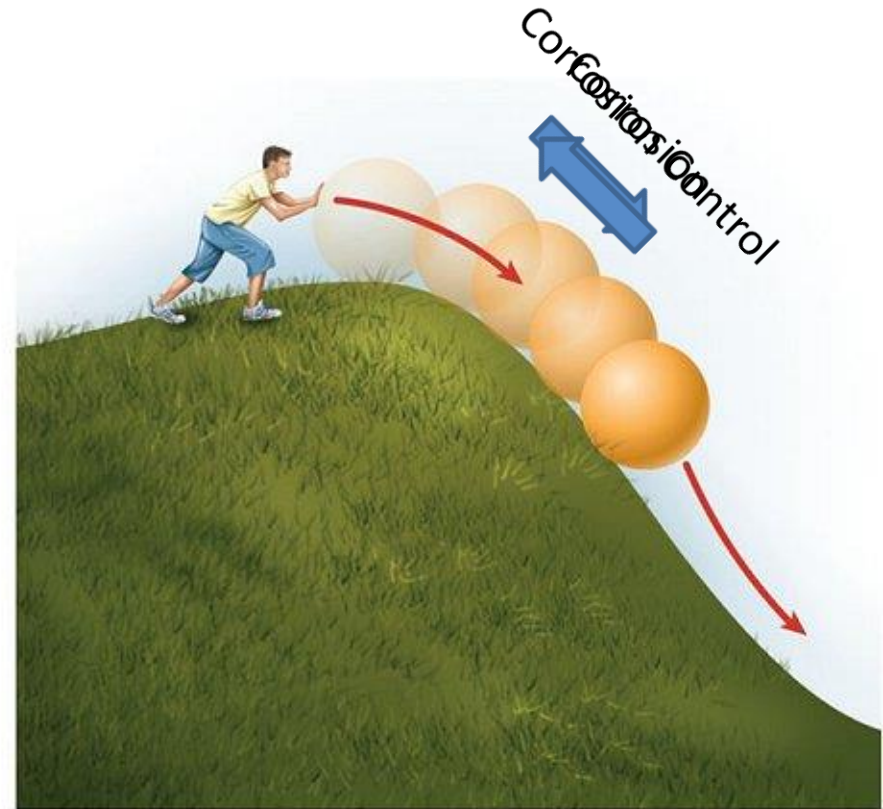
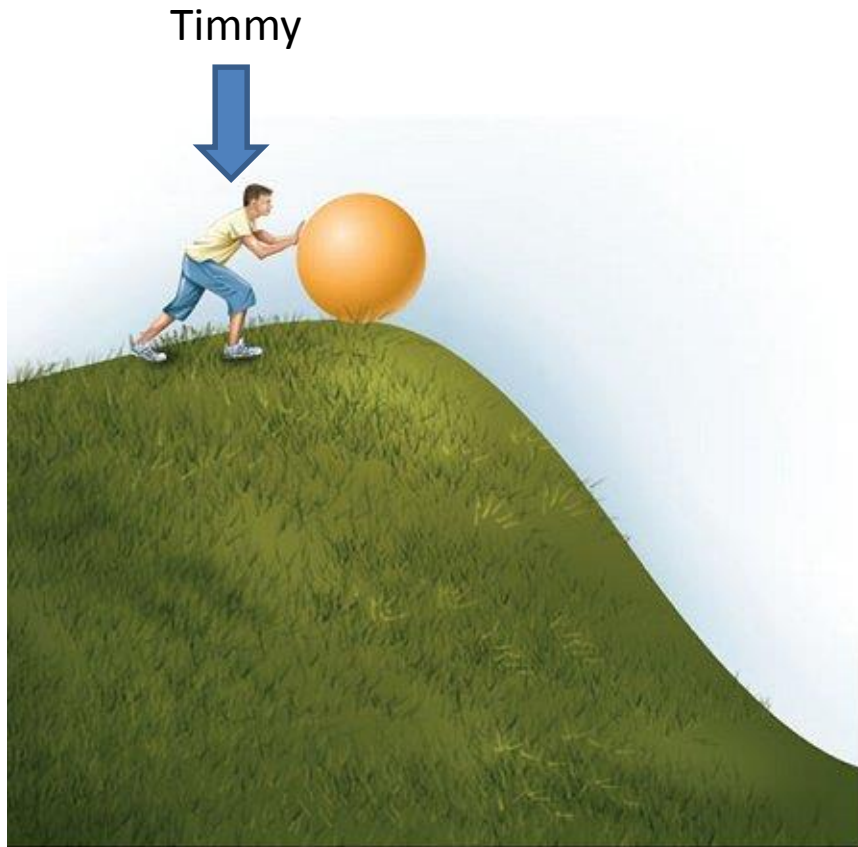
What Is Corrosion?



CORROSION PROCESS = Returns to lowest-energy state



Potential Energy, Thermodynamics, and Timmy



Sisyphus (Greek mythology)

- King of the city of Corinth
- Punished for deceitfulness and for believing he was more clever than Zeus himself
- He was doomed to roll an immense boulder up a hill, only to watch it roll back down, and to repeat this action forever



A Career in Corrosion Control

WHY IS CORROSION CONTROL IMPORTANT?

\$276 Billion

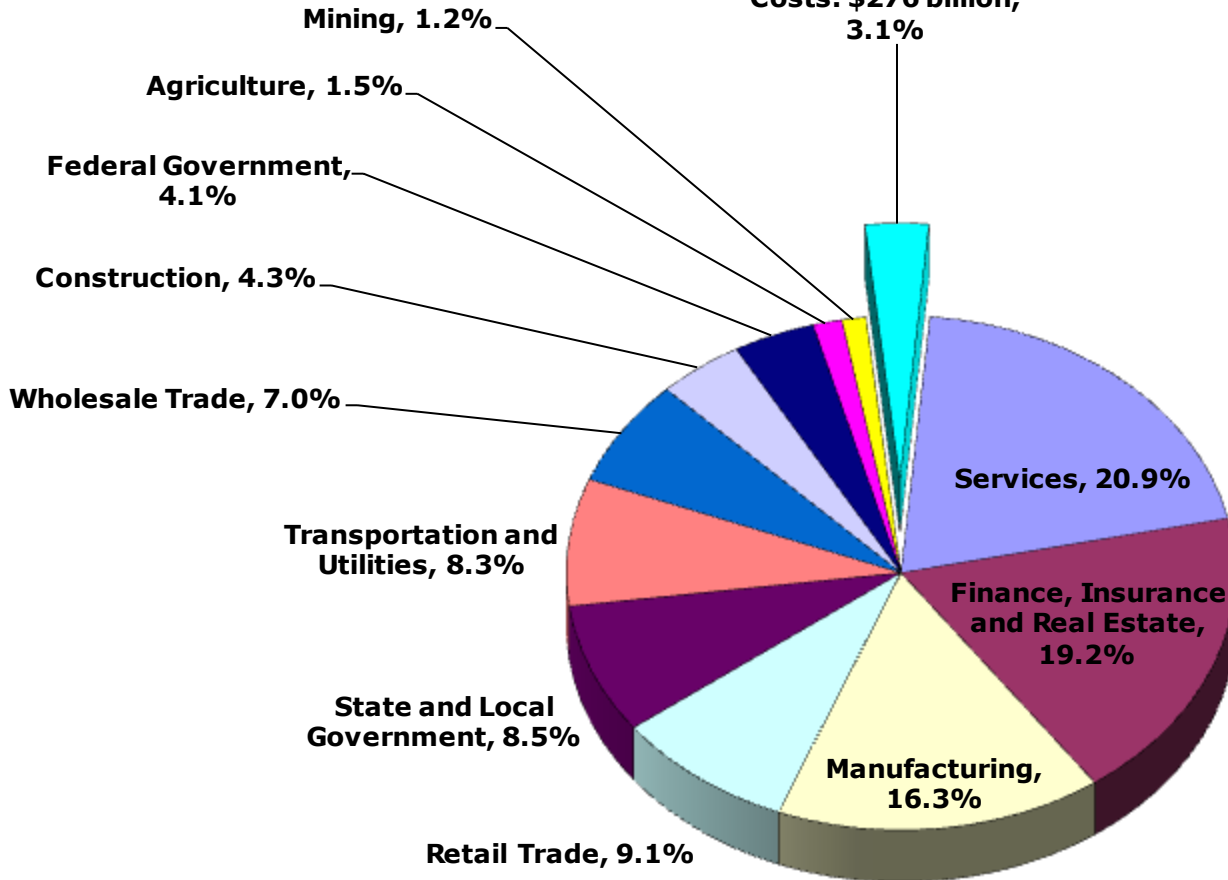
The United States Cost of Corrosion Study



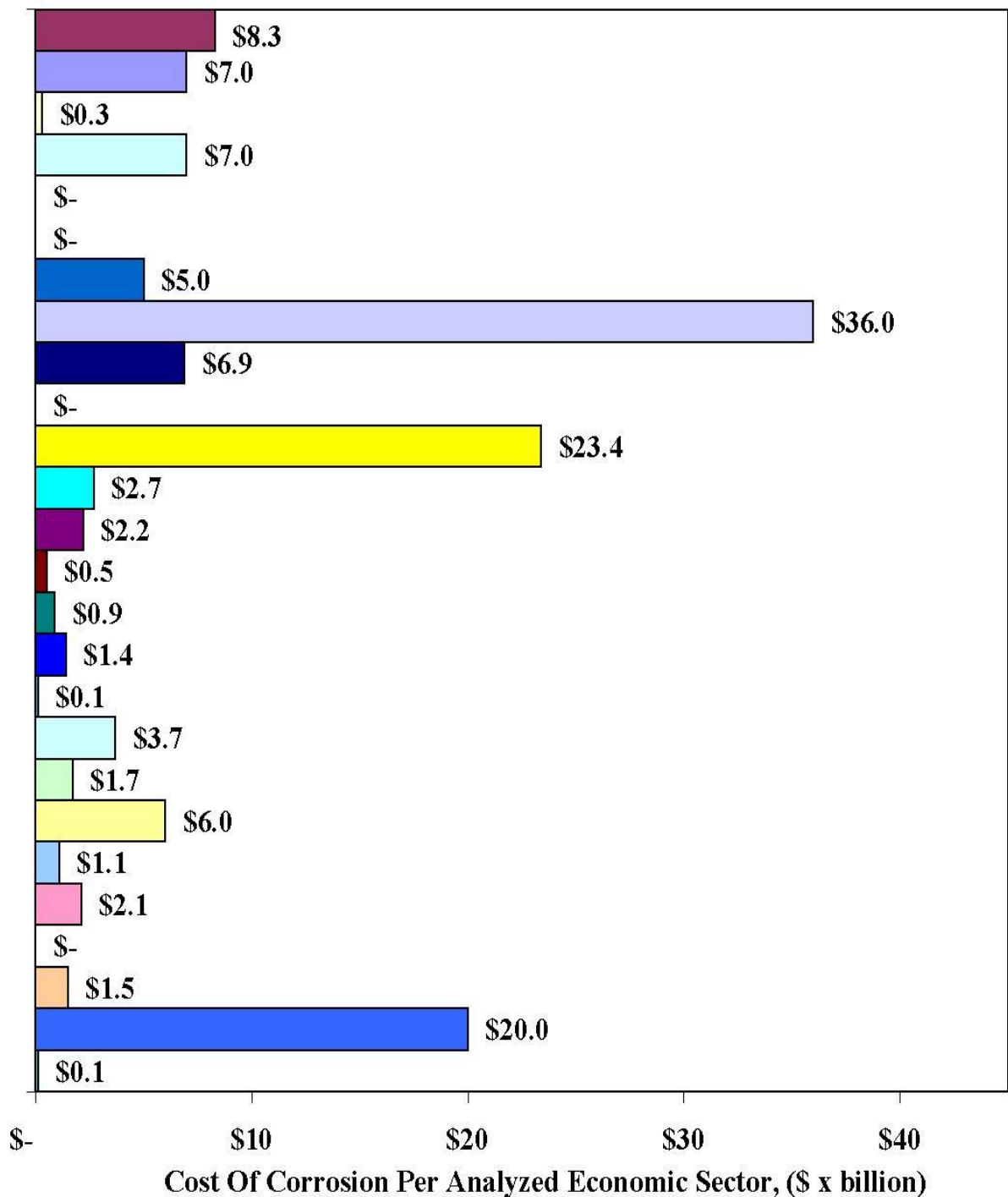
SIXTY YEARS
of SERVICE
1941 - 2003

NACE[®]
INTERNATIONAL
THE CORROSION SOCIETY

**Extrapolated Corrosion
Costs: \$276 billion,
3.1%**



- Highway Bridges
- Gas and Liquid Transm. Pipelines
- Waterways and Ports
- Hazardous Materials Storage
- Airports
- Railroads
- Gas Distribution
- Drinking Water and Sewer Systems
- Electrical Utilities
- Telecommunication
- Motor Vehicles
- Ships
- Aircraft
- Railroad Cars
- Hazardous Materials Transport
- Oil and Gas Expl. and Production
- Mining
- Petroleum Refining
- Chem., Petrochem., Pharm.
- Pulp and Paper
- Agricultural
- Food Processing
- Electronics
- Home Appliances
- Defense
- Nuclear Waste Storage



A Career in Corrosion Control

**WHY ELSE IS CORROSION CONTROL
IMPORTANT?**

Guadalajara Sewer Explosions



Mianus River Bridge



Aloha Airlines Flight 243



Maltese Tanker MV Erika



Prudhoe Bay – Alaska North Slope



Subaru Recalls 660,000 Vehicles for Brake Line Corrosion

Hyundai Recalls 239,000 Cars for Corrosion Problem

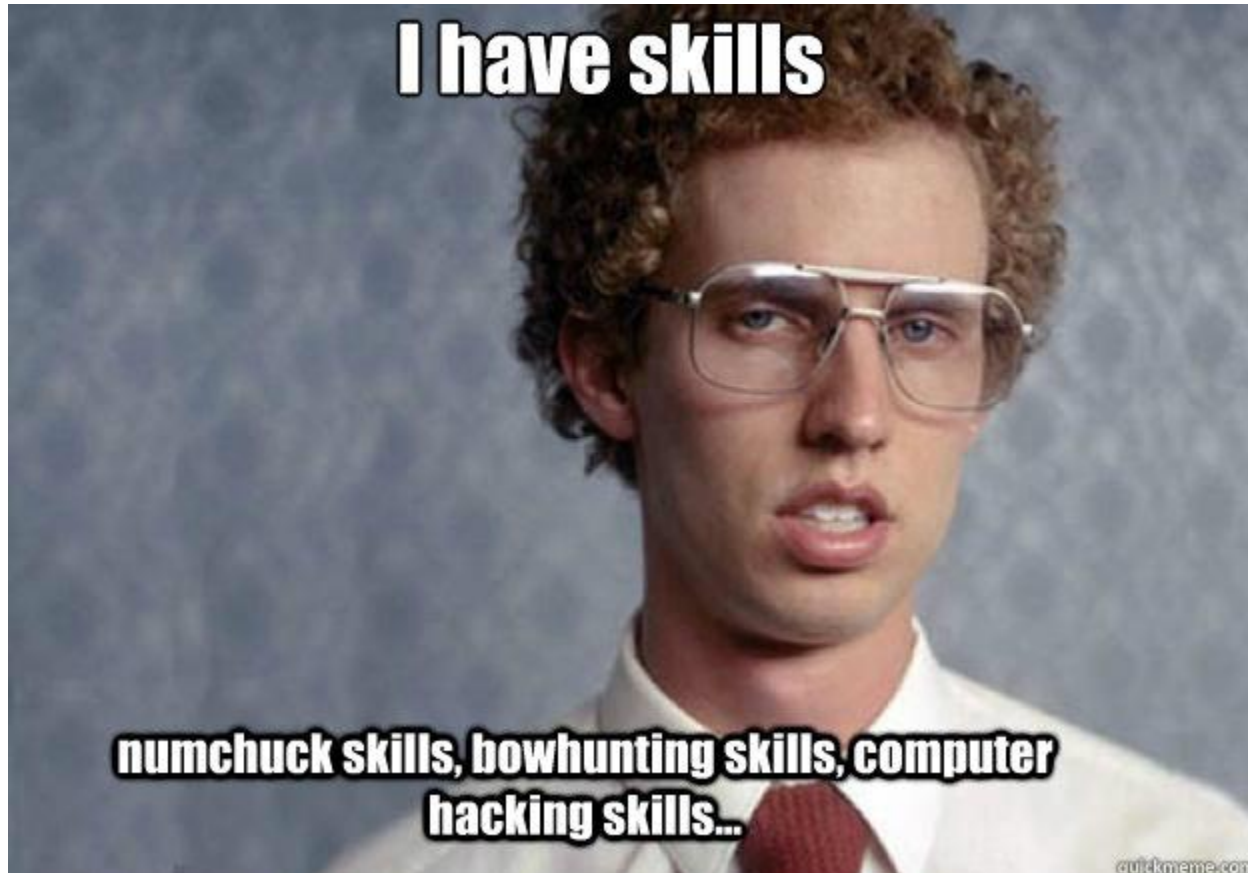
**Toyota Recalling More Than 1 Million Vehicles
Due to Rear Suspension Arm Corrosion**

Ford recalls 435,000 vehicles Because of Subframe Corrosion Issue

A Career in Corrosion Control

WHAT DOES A CAREER IN CORROSION CONTROL LOOK LIKE?

Typical Corrosion Engineer



Careers in Corrosion Control

Pros

- All the free pens & baseball hats you could ever want
- You are not expected to spend a lot of money on your wardrobe
- Your goals are to fight the good fight, protecting people, property and the environment
- These goals are for the good in the long run

Cons

- Doomed to a life of futility and hard labor
- Your colleagues are not going to win any best-dressed awards either
- The Laws of Thermodynamics always win
- In the long run, we're all dead

Different Roles in Corrosion

- Academic
- Aerospace
- Anodic/Cathodic Protection
- Chemical Processing
- Coatings and Linings
- Engineering/Architecture Consulting Firm
- Government
- Instrumentation
- Metals and Mining
- Natural Gas Utility
- Oil & Gas Extraction
- Oil & Gas Pipeline/Storage Tanks
- Original Equipment Manufacturer
- Plastics/Nonmetals
- Power Plant/Electrical Utility
- Pulp & Paper
- Refining
- Research & Development
- Ships/Marine/Offshore Platforms
- Testing Services
- Transportation
- Water Distribution/Treatment

NACE International Membership

	Total Membership	GROWTH	
		Total Membership	Beyond US & Canada
1946	801		1%
1986	15,003		13%
1995	15,240	2%	17%
2000	15,343	1%	17%
2006	16,003	4%	20%
2007	17,491	9%	24%
2009	21,000	20%	31%
2011	25,723	22%	
2012	28,446	11%	
2013	33,244	17%	
2014	35,000+		

~35,000 members in

- >110 countries
- 8 Areas
- 131 Sections

46% Membership outside USA

Jan 28, 2014 (33,479)

USA: 18,187

Canada: 3,343

China: 1,356

India: 1,023

Australia: 952

UK: 916

Saudi Arabia: 483

UAE 458

Career Progressions in Corrosion

- Technical
 - Typically single-contributor
 - Continue to develop technical skills and experience throughout career
 - Degrees, certifications, licenses and other credentials may be important
- Business
 - Manage people and/or projects
 - Importance of technical skills decreases throughout career
 - Credentials related to corrosion are often not required
 - Other roles of NACE become more important, such as networking, marketing, sales, recruiting, etc.

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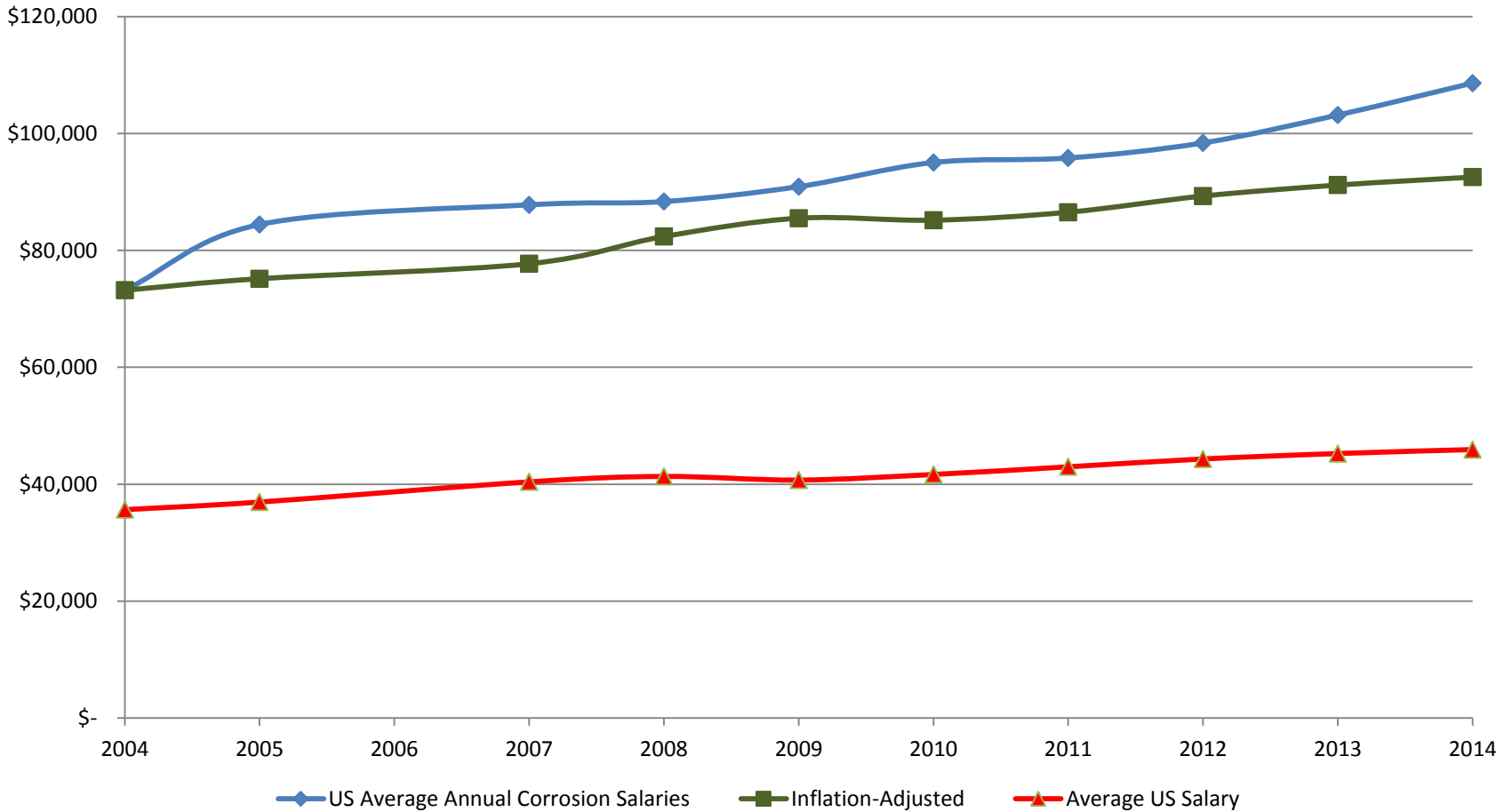
WHY CONSIDER A CAREER IN CORROSION CONTROL?

NACE CORROSION CAREER

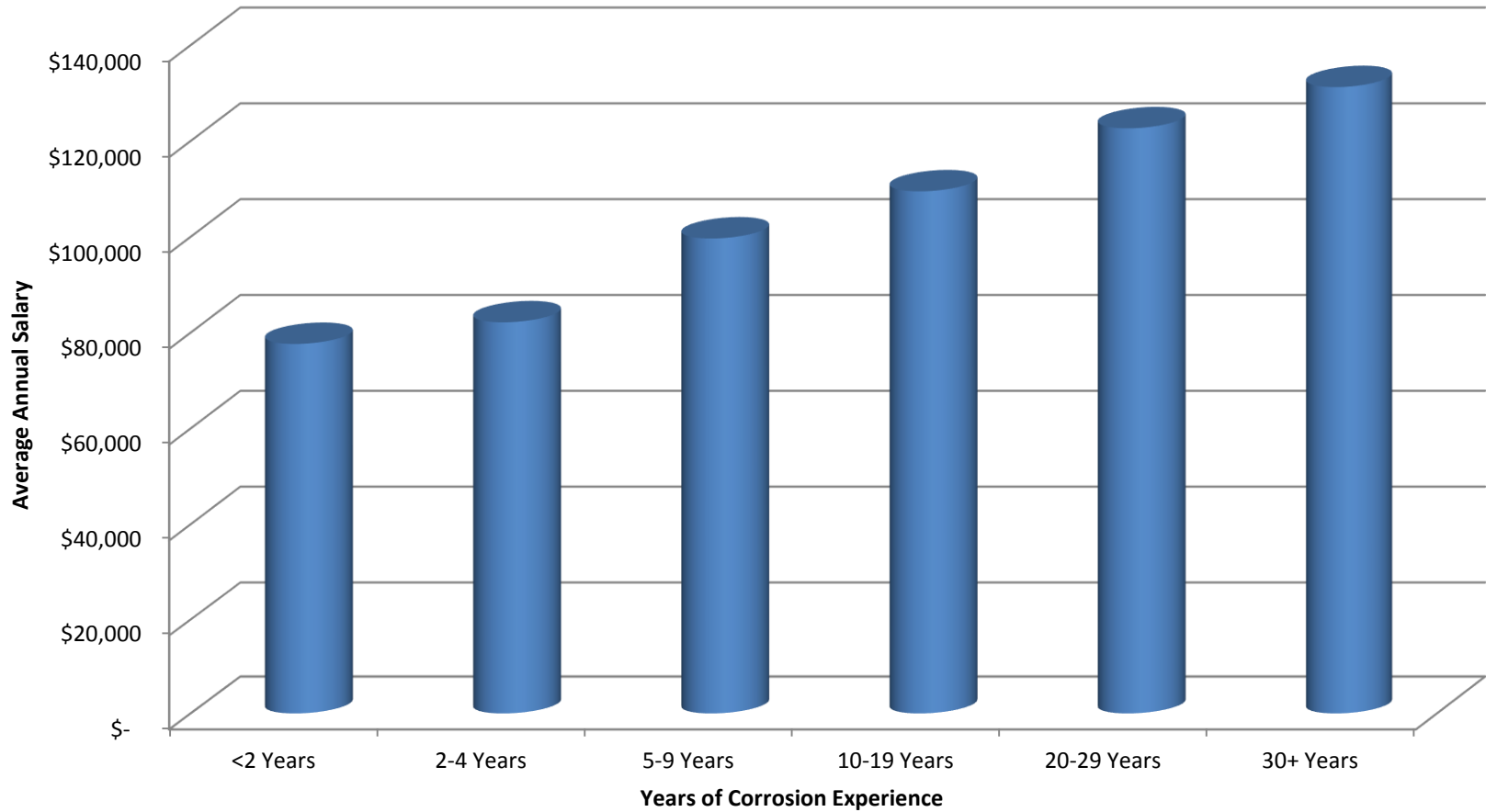
and SALARY SURVEY



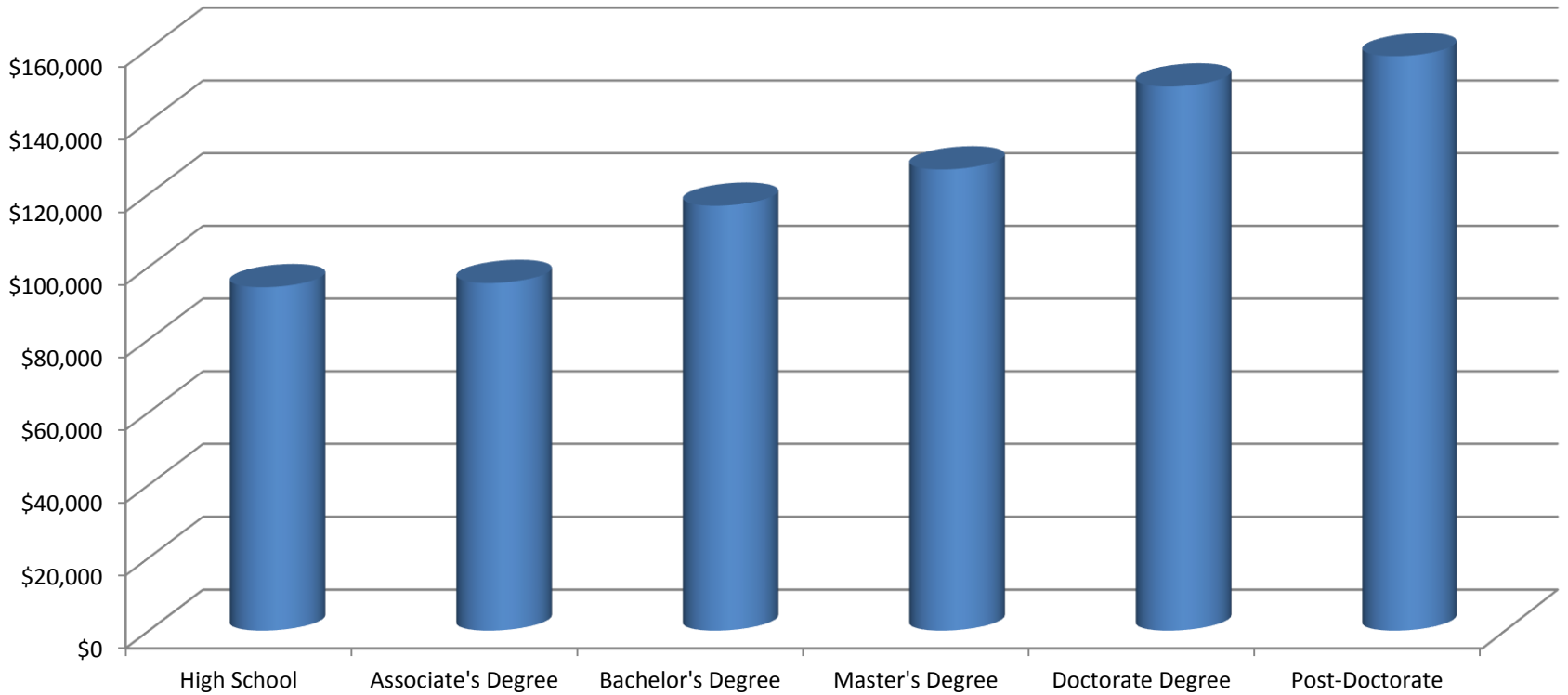
US Average Annual Corrosion Salaries



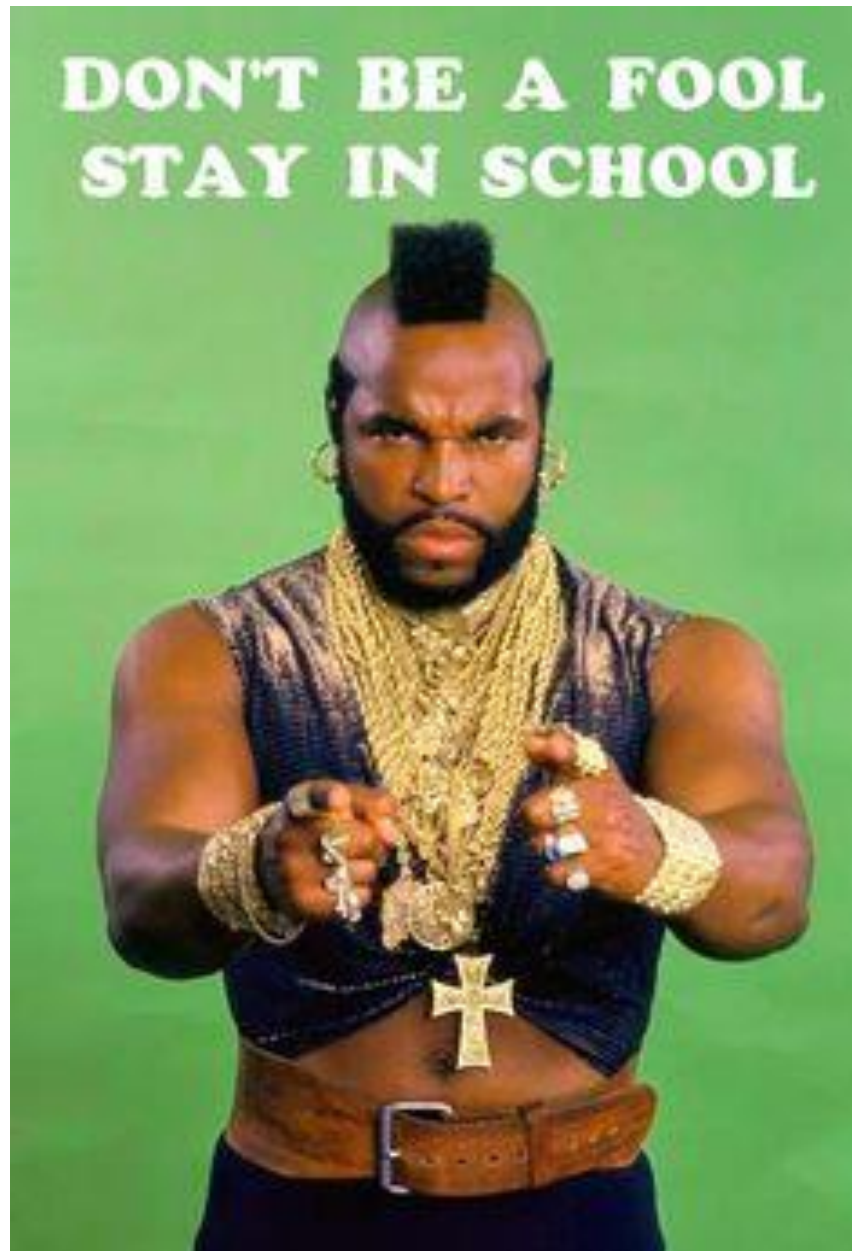
Salary by Years of Experience



Salary by Education Level



**DON'T BE A FOOL
STAY IN SCHOOL**



Corrosion Education

- Two-year college programs
 - Kilgore College
 - Houston Community College
 - Lone Star College
- Corrosion Engineering degree program
 - University of Akron
- Training & Certifications
 - NACE International and NACE Institute

Corrosion Education

Arizona State University
Boise State University
California Polytechnic State University
California State University Northridge
Case Western Reserve University
Clarkson University
Colorado School of Mines
Cornell University
Florida Atlantic University
Florida Institute of Technology
Florida International University
Georgia Institute of Technology
Institute of Paper Science & Technology
Iowa State University
Johns Hopkins University
Kilgore College
Louisiana State University
Massachusetts Institute of Technology
Michigan Technological University
Missouri University of Science and Technology
Montana State University
New Mexico Tech
North Dakota State University
Northeastern University
Northern New Mexico College
Ohio State University
Ohio University
Oklahoma State University
Old Dominion University
Oregon Graduate Institute of Science and Technology
Rensselaer Polytechnic Institute
Texas A&M University

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