

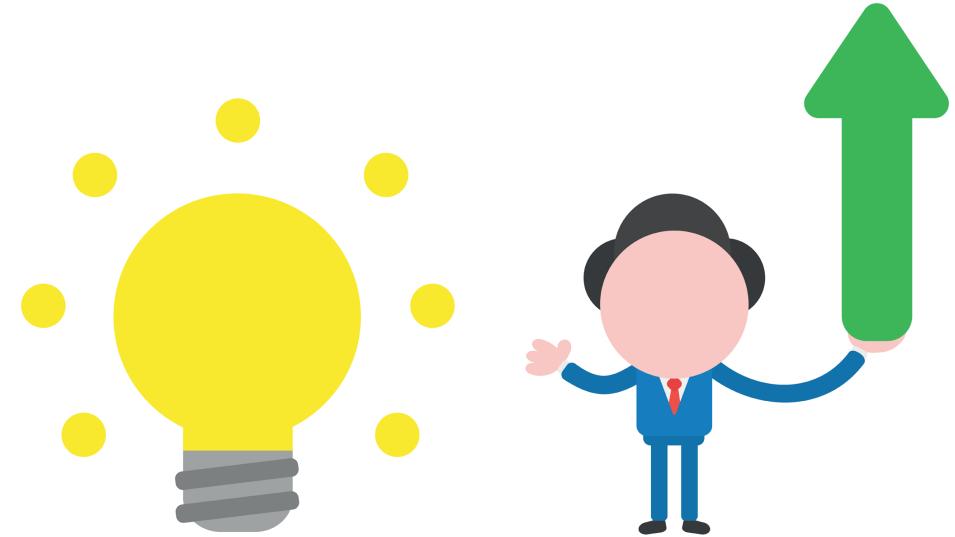
# **Why don't nobody want to join maintenance?**

**Getting people's attention  
Fixing misinformation**

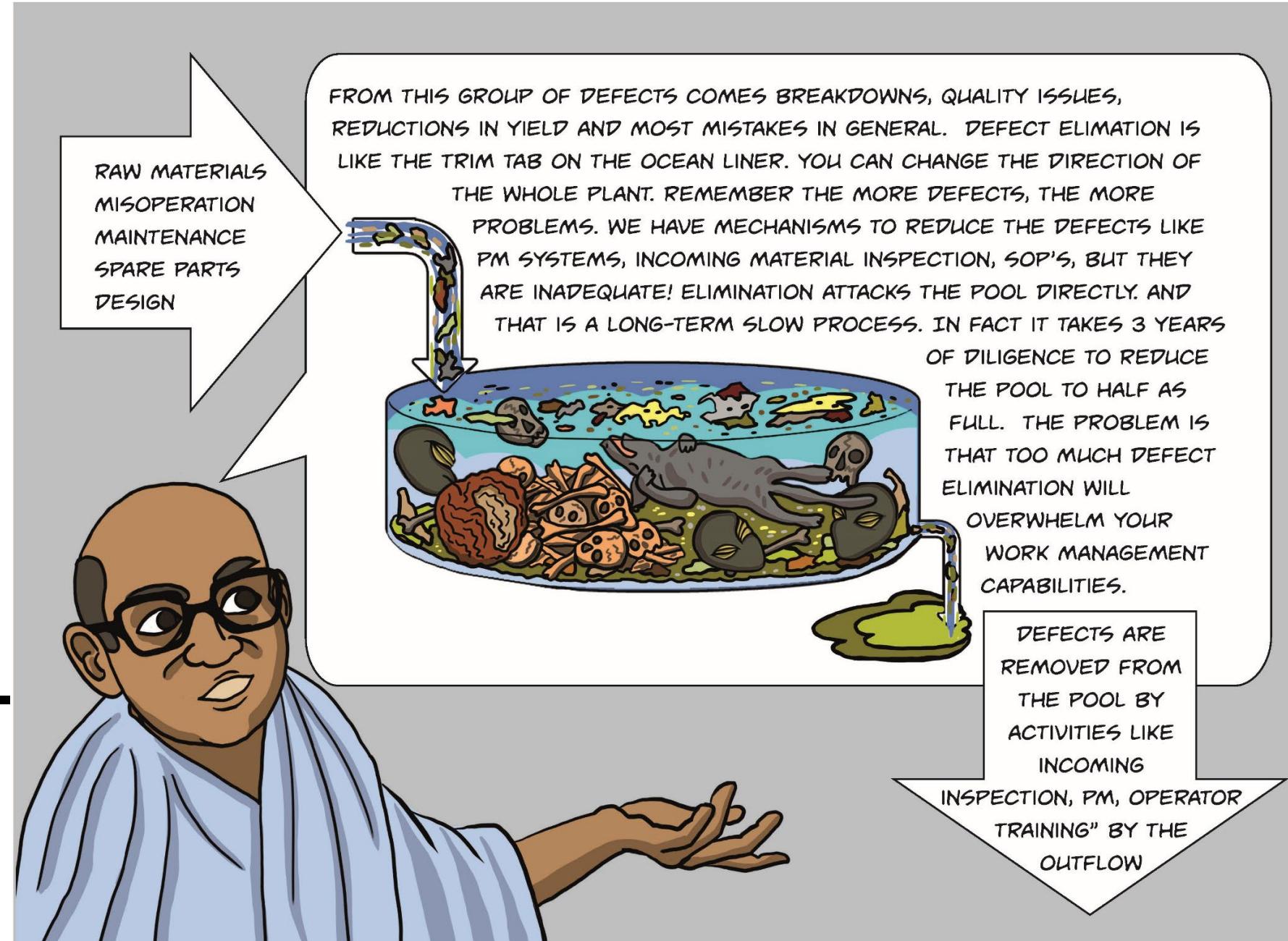


In addition to looking at maintenance as a career I want to introduce an approach to teaching maintenance ideas that does not scare people away.

- 12 Maintenance Concepts explained
- Fun explanation, humor



# First concept: There are defects floating around ready to insert themselves into your day- to-day operation



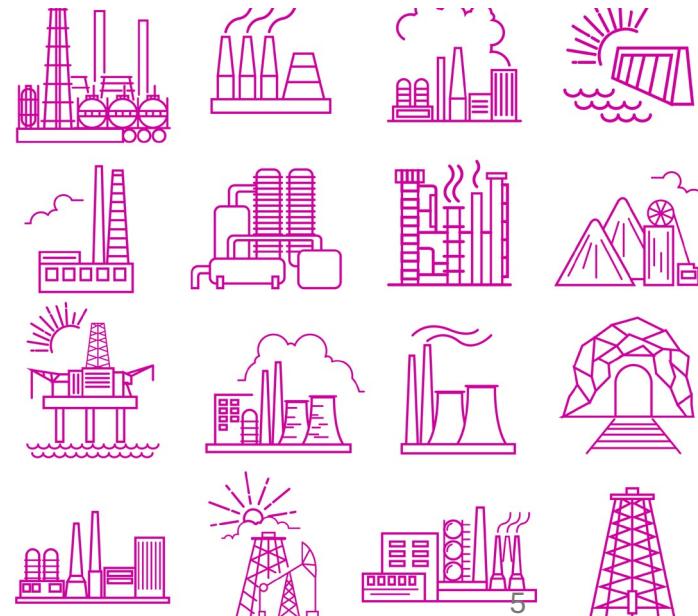


**Once you  
start to look  
around,  
you'll see  
defects  
everywhere**

# Question: Why are kids not flocking to industrial maintenance as a career choice?

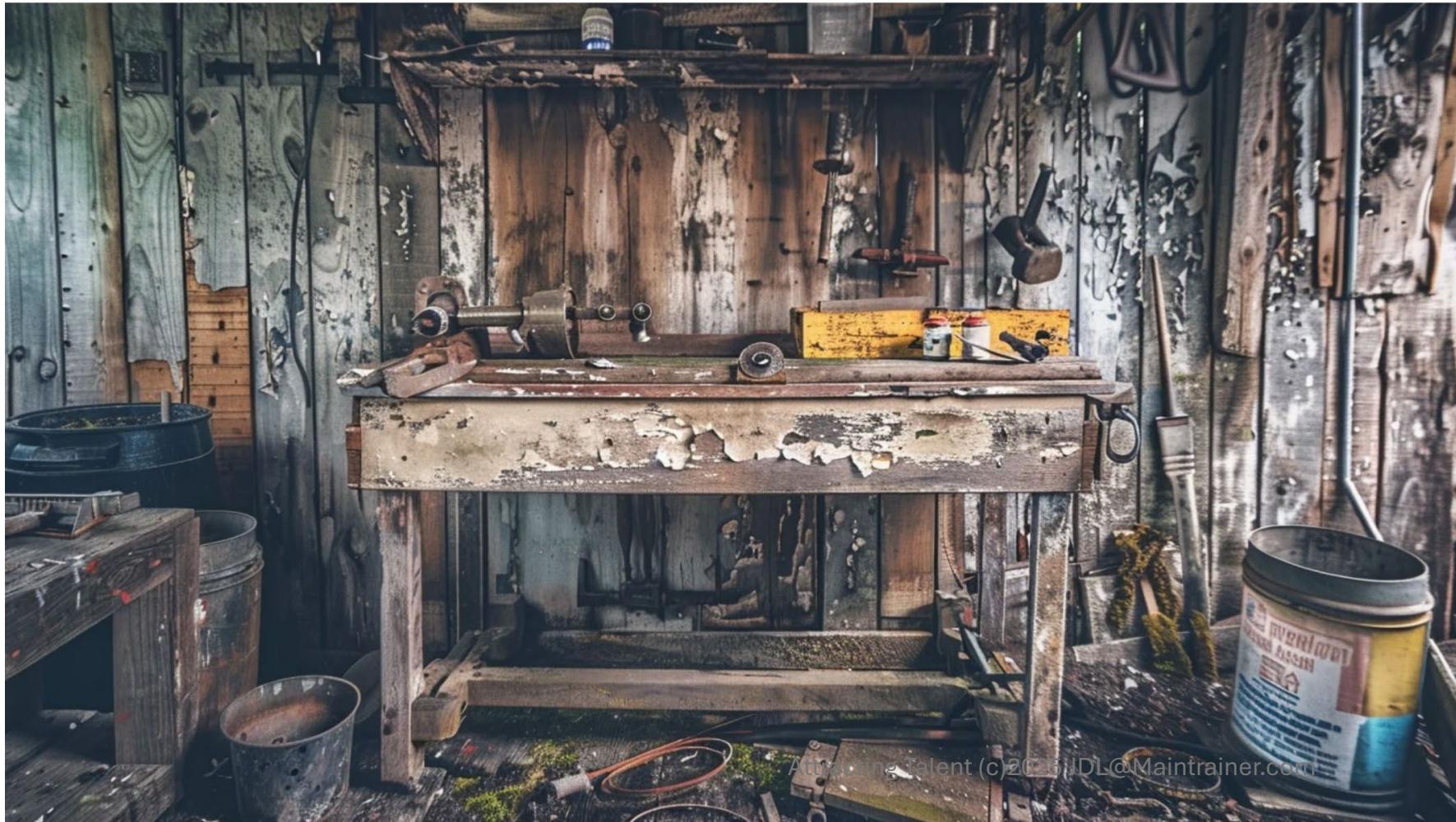


Maintenance career



# Let's investigate some of the reasons given

**Negative Perceptions** Industrial maintenance is often associated with physically demanding, dirty, or less glamorous work. There's also a prevailing perception that industrial jobs are less prestigious. [ISA Blog](#)



# Lack of Awareness Many students are simply unaware of the career opportunities in industrial maintenance.



Schools often prioritize traditional academic pathways, like college degrees, over trade and technical careers. [Sterling Engineering](#)



There's been a reduction in vocational programs that introduce students to industrial maintenance skills. [Sterling Engineering](#)

# Physical Demands

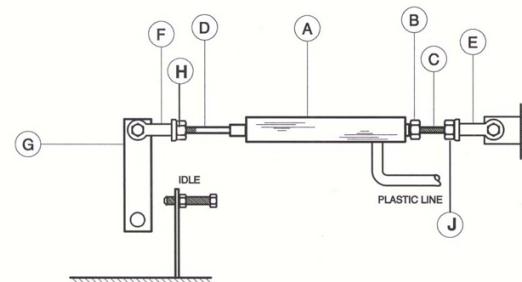
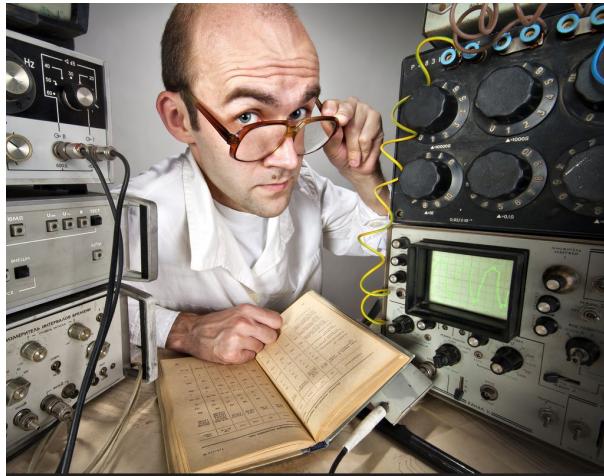
The physical nature of the job may discourage some, especially in an era where many prioritize less physically intensive roles.

ISA Blog



# Misunderstanding the Jobs in Maintenance

Many young people don't fully understand the modern industrial maintenance profession, which often involves advanced technology, problem-solving, and good pay.



The engine idle and full speed settings are set and sealed at the factory, and should not be adjusted. Serious injury may result if the idle speed is increased. Removal of the seals without authorization could affect the warranty. If speed settings are lost due to engine fuel pump service or other repairs, the speed settings can be reset as follows:

#### Before Starting

- At the Pressure Regulator (on service piping near receiver tank). Remove the cover to expose the adjusting screw. Loosen the jam nut and turn screw

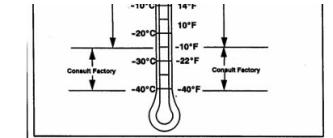
#### After Starting Unit

- If equipped, push the SERVICE AIR button on the control panel, making certain the button does not pop back out. The unit should speed up and then unload (and drop back to IDLE). With the unit unloaded, turn the adjusting screw on the pressure regulator clockwise until the discharge pressure gauge indicates 125-130 psi. Tighten the pressure regulator jam nut. Replace cover.
- With the service valve closed, adjust IDLE speed (\*). Adjust speed using adjusting rod (D). Tighten jam nut (H).
- With the service valve closed, adjust IDLE speed (\*). Adjust speed using adjusting rod (D). Tighten jam nut (H).

# Maintenance Manuals and textbooks

consumption) may be greater with the use of alternative fluids.

Design Operating Pressure	Ambient Temperature	Specification
100 psi to 300 psi	-10°F to 125°F (-23°C to 52°C)	Preferred: IR Pro-Tec™ Alternate: ISO Viscosity Grade 46 with rust and oxidation inhibitors, designed for air compressor service.
350 psi	(-23°C to 52°C) -10°F to 125°F	Preferred: IR XHP 605



Preferred Ingersoll-Rand Fluids - Use of these fluids with original I-R filters can extend airenad warranty. Refer to operator's manual warranty section for details or contact your IR

If you start learning maintenance the materials are boring, hard to follow, obscure, not inviting.

#### Operating & Maintenance Manual

#### SECTION 5 - OPERATION

- Power Switch** - Rotate "ON" to activate system prior to starting. Rotate "OFF" to stop engine. (Standard)
- Engine Speed Gauge** - Indicates engine speed.
- Discharge Air Temp. Gauge** - Indicates in °F (82°C) to 210°F (99°C).
- Engine Oil Pressure Gauge** - Indicates engine oil pressure.
- Engine Water Temp. Gauge** - Indicates coolant temperature, with normal operating range from 180°F (82°C) to 210°F (99°C).
- Voltmeter** - Indicates battery condition.
- Ether Inject Button** - Injects a measured shot. USE SPARINGLY.
- Service Air Button** - After warm-up, PUSH. Provides full air pressure at the service outlet. Indicates engine speed.
- Spare**
- Spare**

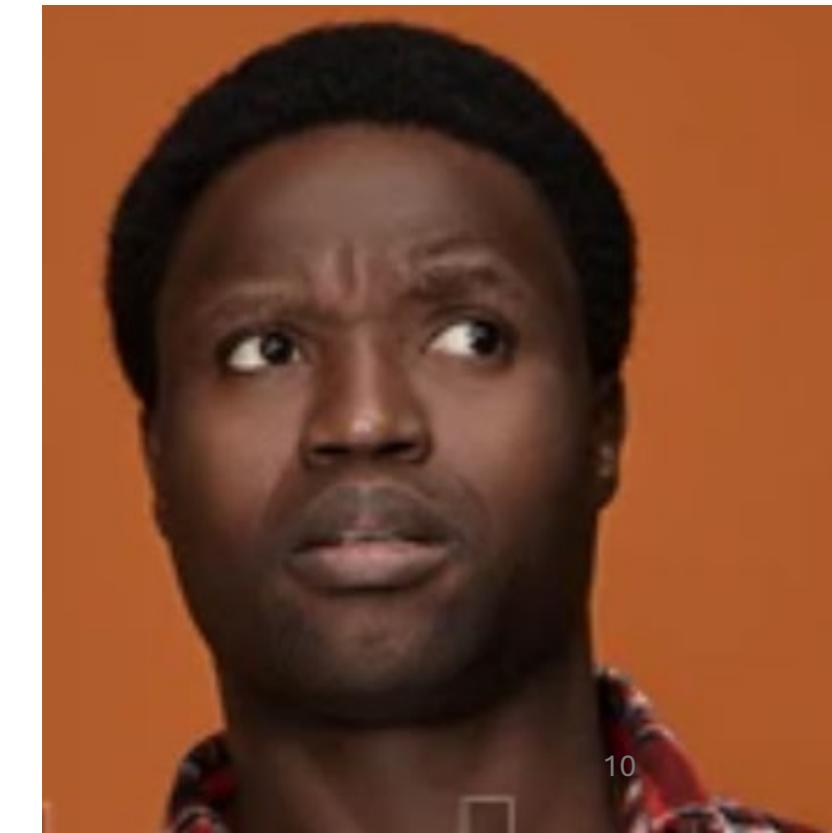
#### Instruments & Controls (Optional)

- High Engine Temperature** - Coolant above 220°F (104°C).
- Low Engine Oil Pressure** - 12 psi or less.
- High Compressor Temperature** - 248°F (120°C)

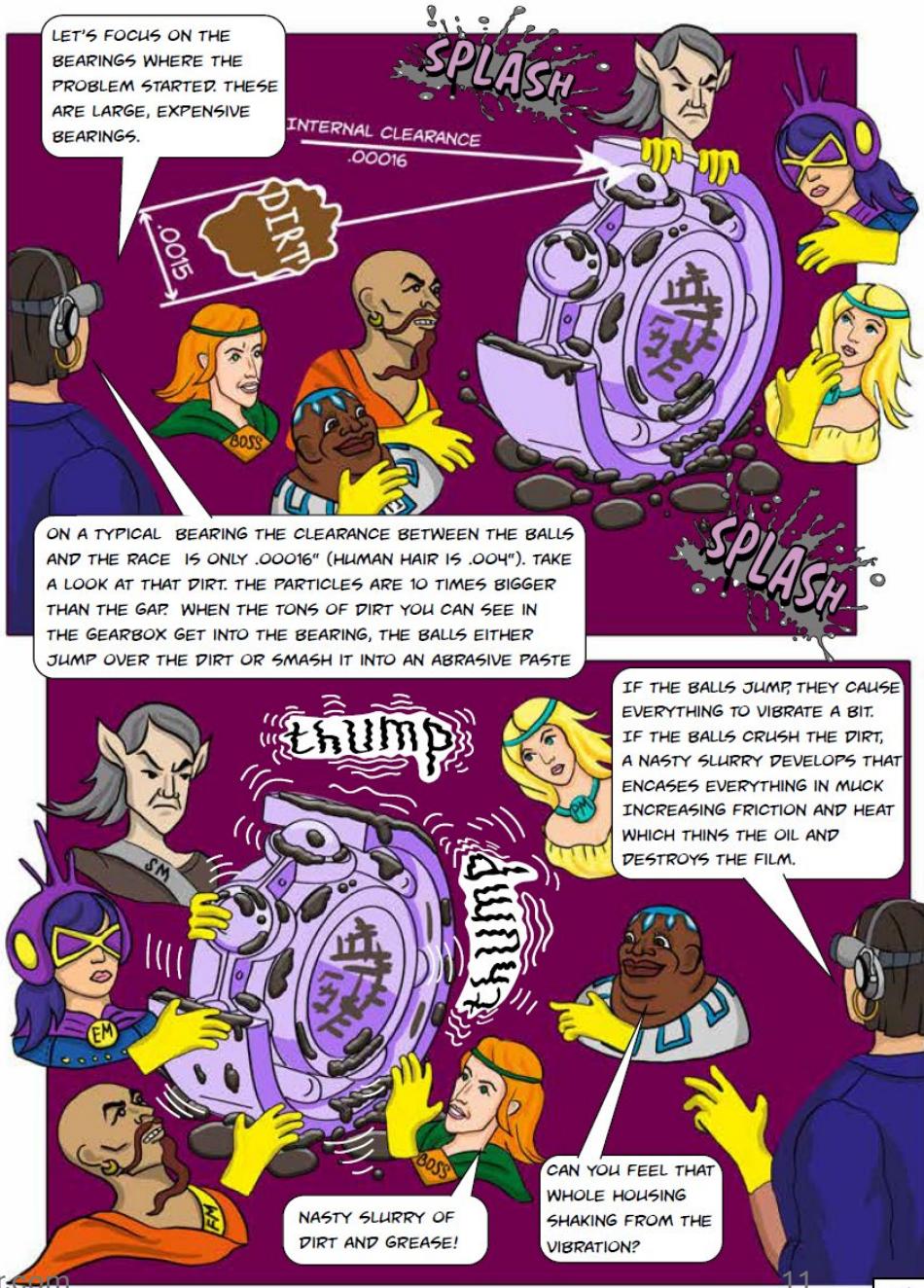
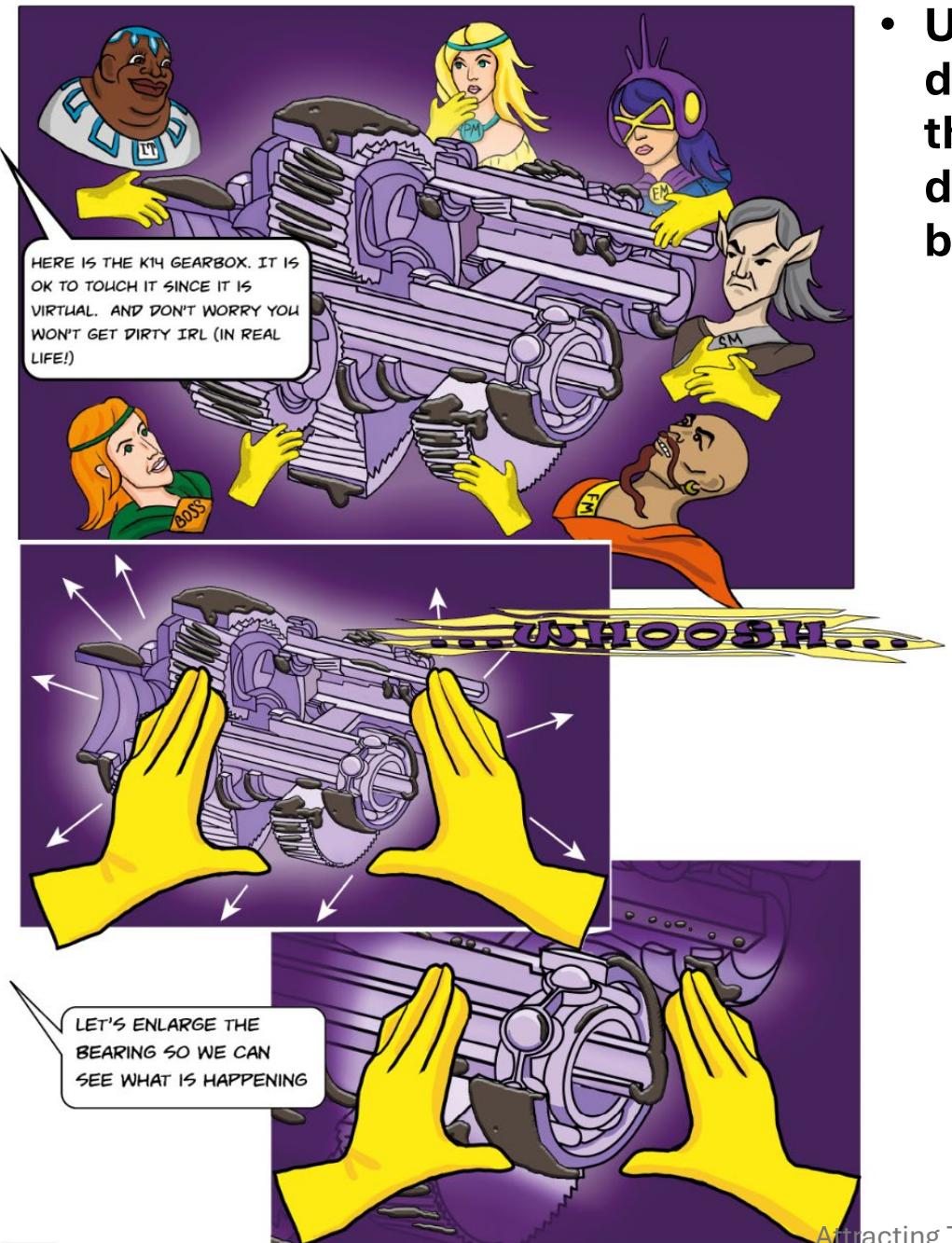


# Misalignment with Technological Advancements- Evolving Skill Requirements:

Younger workers may not be aware that modern industrial maintenance involves lots of sophisticated technology, which could align with their tech-savvy nature. [Sigga](#)



- Using VR to demonstrate the impact of dirt in a bearing



# DEAD END JOBS

SWITCHBOARD  
OPERATOR



LAMPLIGHTER



COOPER



MUSIC STORE  
EMPLOYEE



JOURNALIST



ELEVATOR  
OPERATOR



TRAVEL AGENT



## Perceived Lack of Career Progression

Some may see industrial maintenance as a dead-end job without room for growth or advancement.

# Generational Differences in attitudes toward work:

Younger generations often gravitate towards careers perceived as more progressive, technologically advanced, or aligned with personal values.

Each stage in life has its own concerns, opportunities and challenges



They may also prioritize careers with flexibility, remote work options, or jobs perceived as more aligned with their interests or values. [Sigga](#)

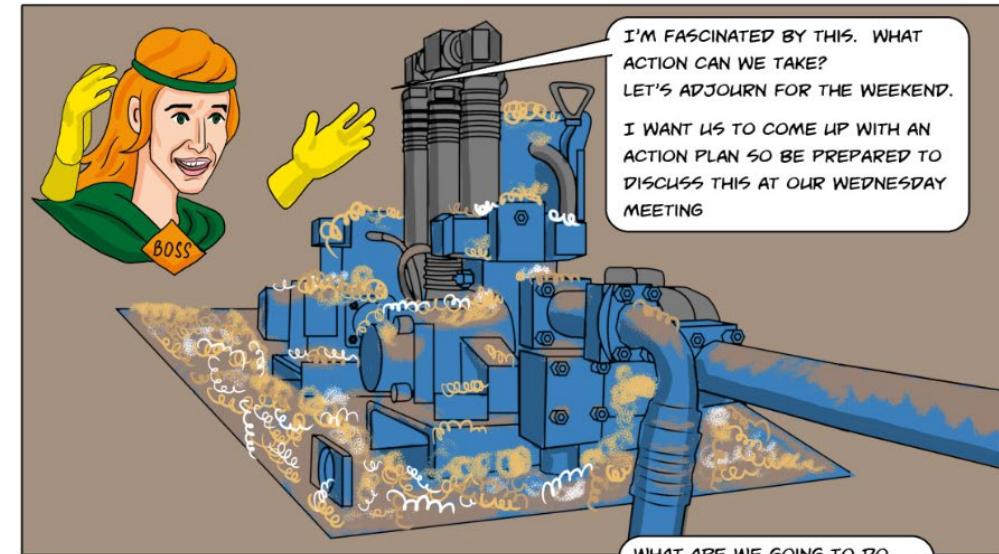
# Concept of friction

# And Lubrication

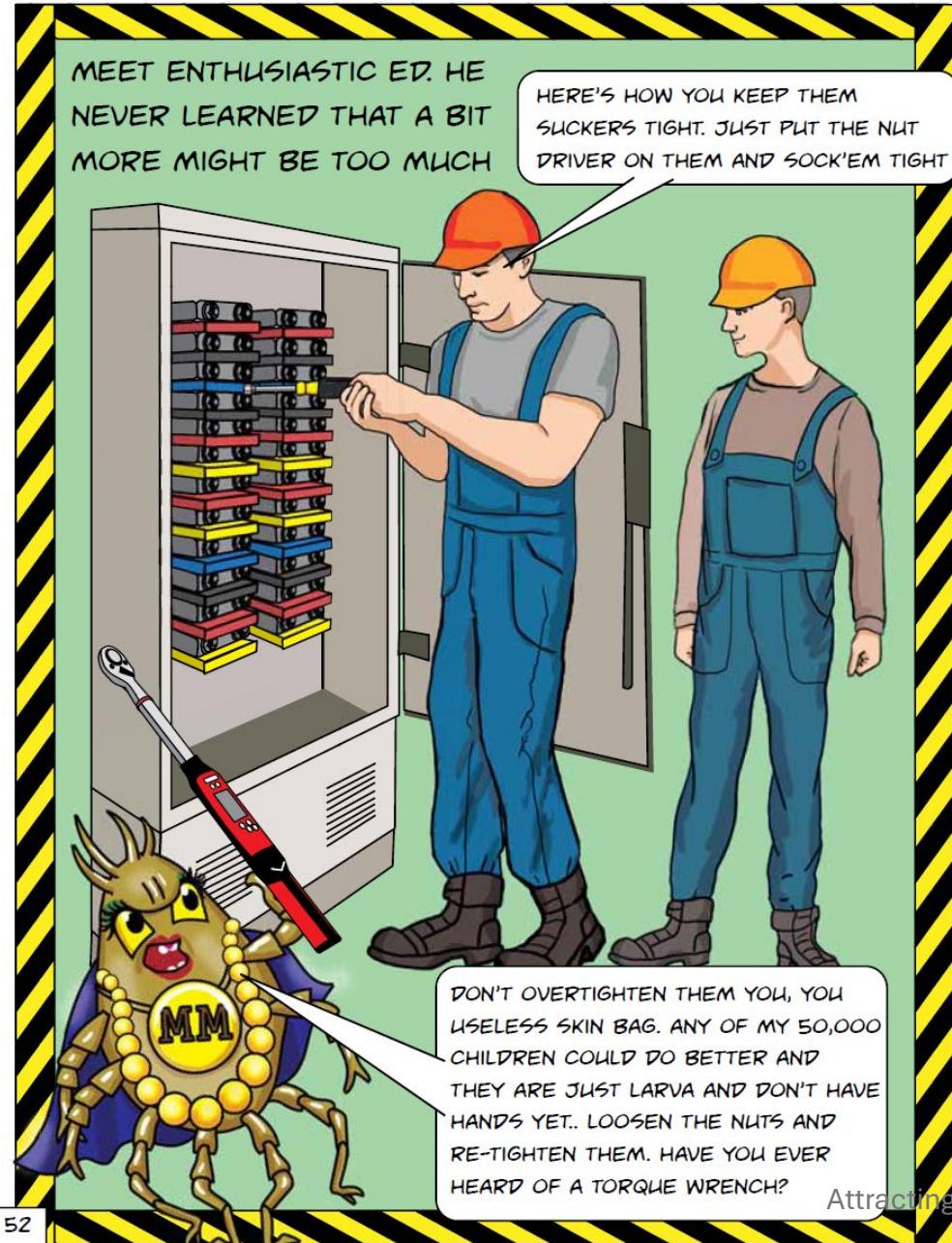




# Dirt



## UNCOMMON- COMMON SENSE



# Avoid over tightening

PREVENTIVE MAINTENANCE WAS EVEN IMPORTANT IN US HISTORY. GENERAL GEORGE WASHINGTON ADDRESSED THE REVOLUTIONARY TROOPS AT VALLEY FORGE ON RIFLE MAINTENANCE



**PM was important to George Washington.**

**It is part of US history**

# HOW DO LUBRICANTS LIKE OIL AND GREASE WORK?

FIRST: VISCOSITY HOLDS THE TWO MATERIALS APART



SO THAT ONE BODY "FLOATS" OVER THE OTHER

HIGH VISCOSITY = STRONG  
LOW VISCOSITY = WEAK

GENERALLY, FOR THE SAME OIL:

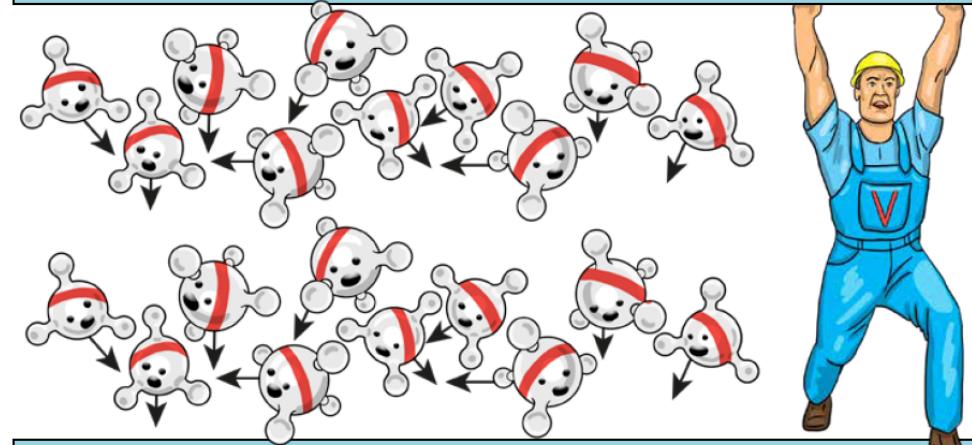
HIGHER VISCOSITY = COLD = OIL IS THICKER = STRONGER FORCE  
LOWER VISCOSITY = WARM = OIL IS THINNER = WEAKER FORCE

SINCE MY GIRLFRIEND STARTED WORKING AT THE GREASE FACTORY.... IT'S BEEN REALLY HARD TRYING TO GET HOLD OF HER.



SECOND: OIL MOLECULES ARE NON-POLAR AND SLIDE BY EACH OTHER EASILY

OIL MOLECULES ARE SLIPPERY BUGGERS



## Viscosity and polarity of lubricants

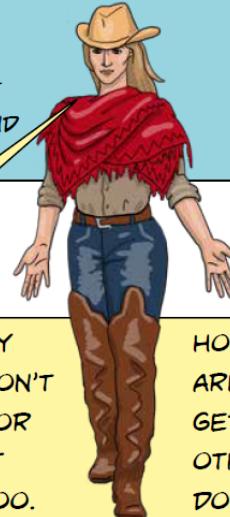
POLAR LIQUIDS ARE LIKE MAGNETS. NORTH ATTRACTS SOUTH BUT REPEL ANOTHER NORTH. POLAR LIQUIDS DON'T MOVE AS FREELY. OIL IS NON-POLAR AND AVOIDS THIS PROBLEM.

OUR FRIEND VISCOSITY STILL HOLDS THE TWO MATERIALS APART

THESE POLAR MOLECULES BEAR SOME EXPLAINING



HONEY IS PRETTY VISCOUS. WHY DON'T YOU USE THAT FOR A LUBRICANT? IT TASTES GREAT TOO.



HONEY MOLECULES ARE POLAR. THEY GET CAUGHT ON EACH OTHER'S CHARGES AND DON'T SLIP BY EASILY

# THREE LAWS OF MAINTENANCE

DON'T FORGET:

IF IT MOVES, AND IT IS SUPPOSED TO  
MOVE, LUBRICATE IT.

IF IT MOVES AND IT IS NOT SUPPOSED  
TO MOVE, DUCT TAPE IT.

IF IT DOES NOT MOVE, AND IT IS NOT  
SUPPOSED TO MOVE, PAINT IT!



## Remembering the basics

**Lack of Mentorship** Without mentors or role models in the field, young people may not see it as a viable or attractive option.





# How come no one thought of a TV program

## The A team

“This sucker won’t break on MY watch!”

Staring Angel Smith and Heather Jones  
fighting deterioration, carelessness, and  
selflessly dedicating their lives to others.

Reliability Accessibility, Maintainability  
and Safety- The team that makes it  
happen

# What Can We Do?

## Quick traditional to do list items:

- **Education and Outreach:** Schools can introduce vocational programs and educate students about the benefits of careers in industrial maintenance.
- **Modernize the Image:** Emphasize the technological aspects of the job and the use of robotics, AI, and other advancements.
- **Recruitment Campaigns:** Industries can invest in targeted campaigns to highlight job security, high wages, and growth opportunities.
- **Apprenticeships:** Offering more hands-on opportunities to young people could help bridge the gap between interest and understanding of the career.

# Inform Kids about some of the positive facts of life about maintenance

- Job is unlikely to be outsourced. You can't PM a machine from Bangalore. Yet!
- You contribute to people's safety, comfort and mission
- Very stable employment since people ~~are stupid and~~ break things
- Skill sets are very transferrable. If you must move because of a spouse's job, you'll be able to find work.
- Always something new
- Way fun when there is a bring your kid to work day
- You don't bring work home, although you might not come home at the same time everyday
- ~~A great job for people who are stubborn, introverted, don't play well with others, opinionated, and love new tools~~

# Be straight with the kids. On the downside let's face it:

- **Can't work from home in your PJs**
- **Must wear clunky shoes**
- **It is hard to keep nice hair in a hard hat**
- **Sometimes, the work problem dominates your life for a while**
- **It helps if you are not scared of heights, flames, and spiders**



MAINTENANCE QUALITY IS WAY MORE COMPLICATED THAN PRODUCTION QUALITY.

WHAT DOES QUALITY MEAN IN A MAINTENANCE DEPARTMENT?  
ANOTHER WAY TO ASK THIS IS WHAT DO YOUR USERS VALUE?

NO DOWNTIME  
NO SCRAP WASTE PRODUCED

SAFE OPERATION  
ON TIME DELIVERY

LOWEST COST  
QUICK RESPONSE

NO REPEAT REPAIRS  
KEEPING THE UNIT IN SPEC

NO INTERRUPTIONS  
A SATISFIED USER

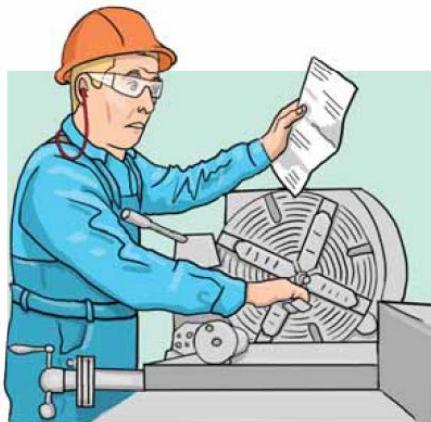
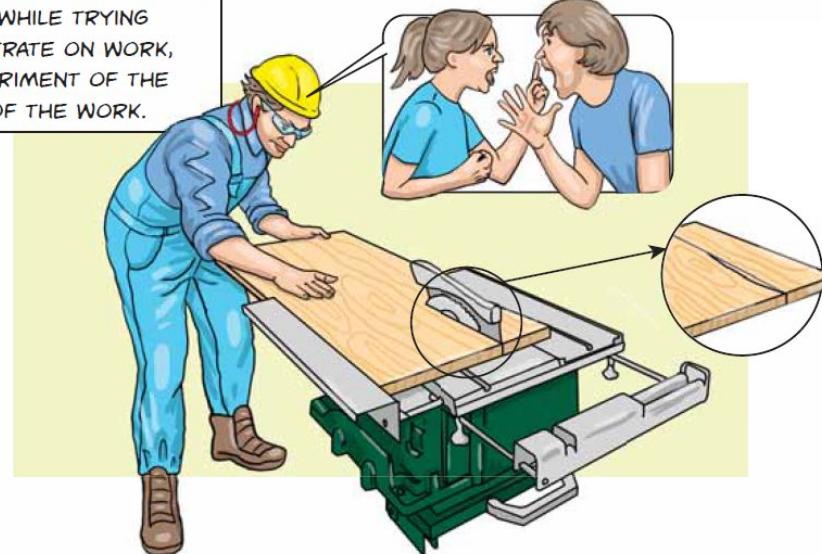
BINGO, LIKE I SAID,  
COMPLICATED!

# Maintenance quality is complicated.

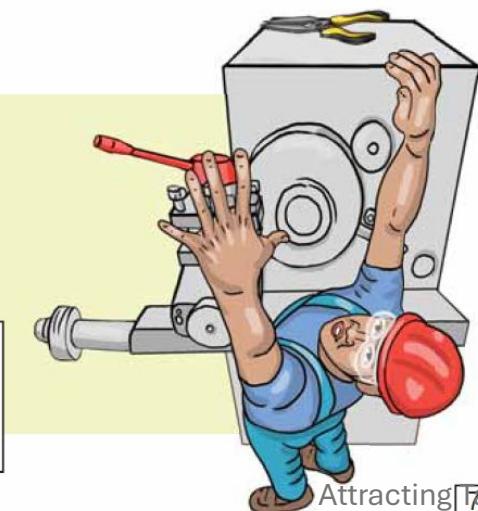
It means different things to different people

PEOPLE ARE SOMETIMES PREOCCUPIED. PEOPLE OFTEN THINK ABOUT THINGS THAT HAPPEN AT HOME WHILE TRYING TO CONCENTRATE ON WORK, TO THE DETRIMENT OF THE QUALITY OF THE WORK.

**PEOPLE**



SOMETIMES PEOPLE ARE AFRAID TO ASK WHAT TO DO OR HOW TO DO IT. THEY DO WHAT THEY DO AND QUALITY MIGHT SUFFER



SOMETIMES PEOPLE ARE NOT STRONG ENOUGH AND DON'T LIKE TO ASK FOR HELP

**One of the 7 barriers to quality is people!**

**In this case**

- 1. Preoccupied**
- 2. Afraid to ask for help**

# What makes maintenance fun

- You get to solve problems.
- You routinely get the feeling of a job well done.
- You get to overcome challenges and adverse circumstances.
- You get to help people and be of service.
- You get to help people do their job.
- When you travel you can visit other maintenance departments.
- You get to be active.
- You get to learn interesting things.
- You get to participate on teams and lead teams.



# The Money is not bad

## Some facts about the Money

- Industrial Maintenance Technician:

Prerequisites: Years of grunt labor, Apprenticeship or 2-year Assoc degree

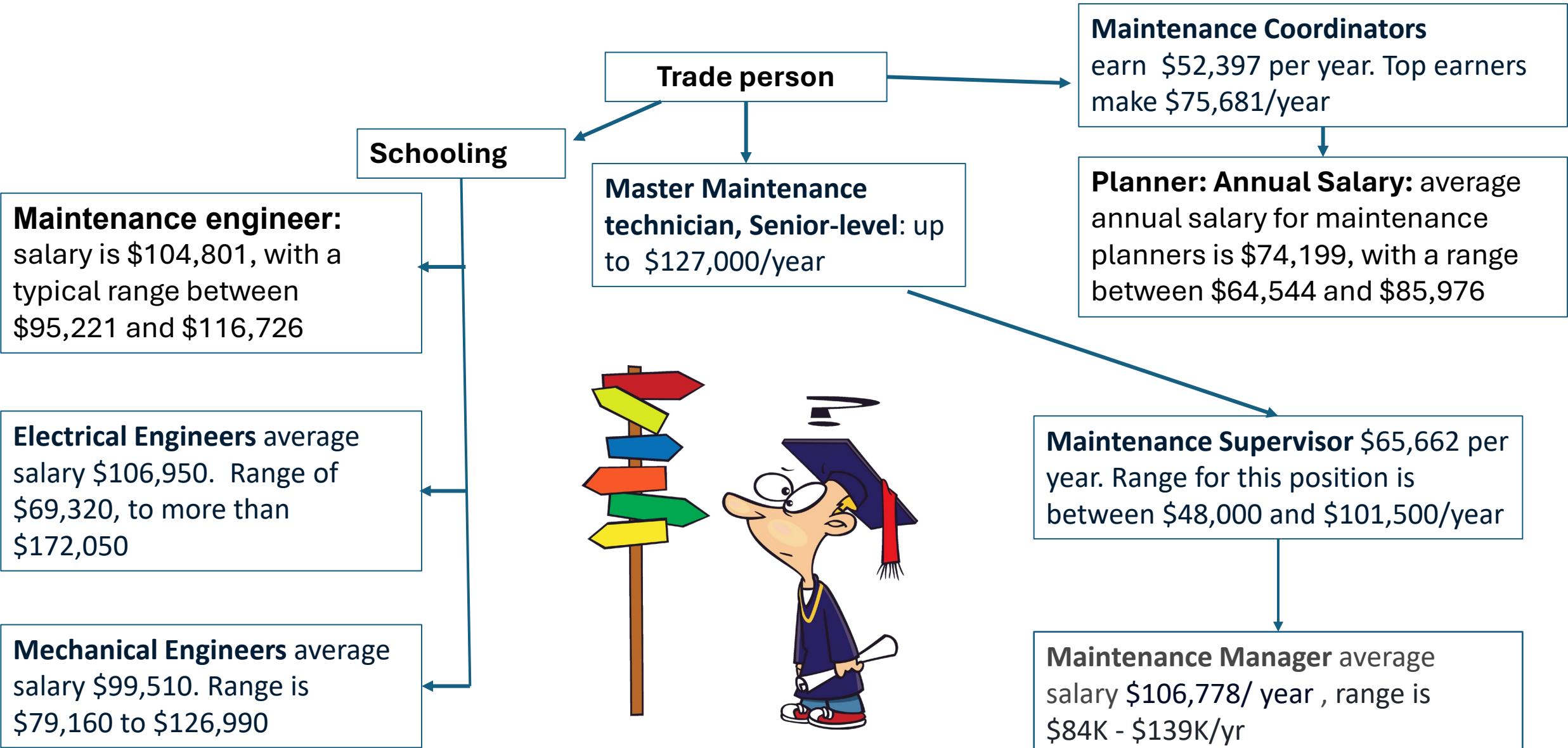
The average annual salary is approximately \$73,888, with a typical range between \$64,456 and \$85,030.

Not as well paid as surgeons, data scientists, merchant bankers, lawyers but more fun, more grounded.

On the plus side -Maintenance people's families are rarely kidnapped for ransom



# Perceived Lack of Career Progression is a myth



# Physically Demanding

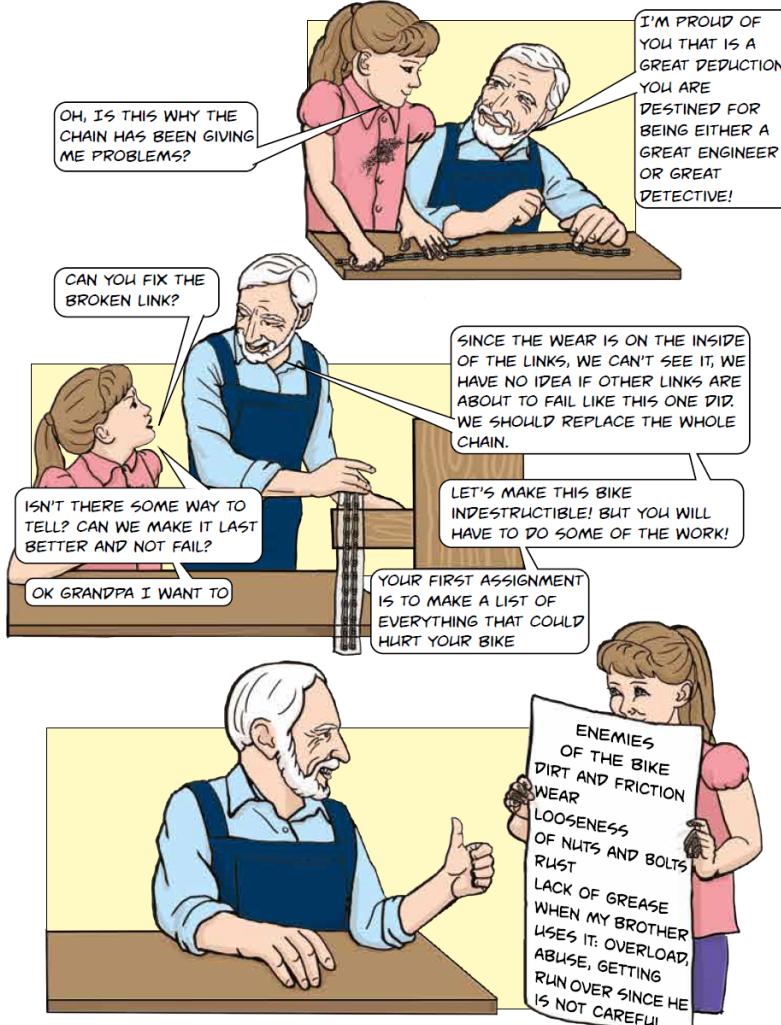
- Did you know that sitting at a desk (being sedentary) is considered as bad for you as smoking!
- Yes, Maintenance gets you away from the desk.
- Yes, Maintenance is occasionally very physical
- As you get more experienced your work becomes easier
- Yes, You are paid to do it, you do not have to pay for the gym



# Make it more fun to learn

- This is where I come in.

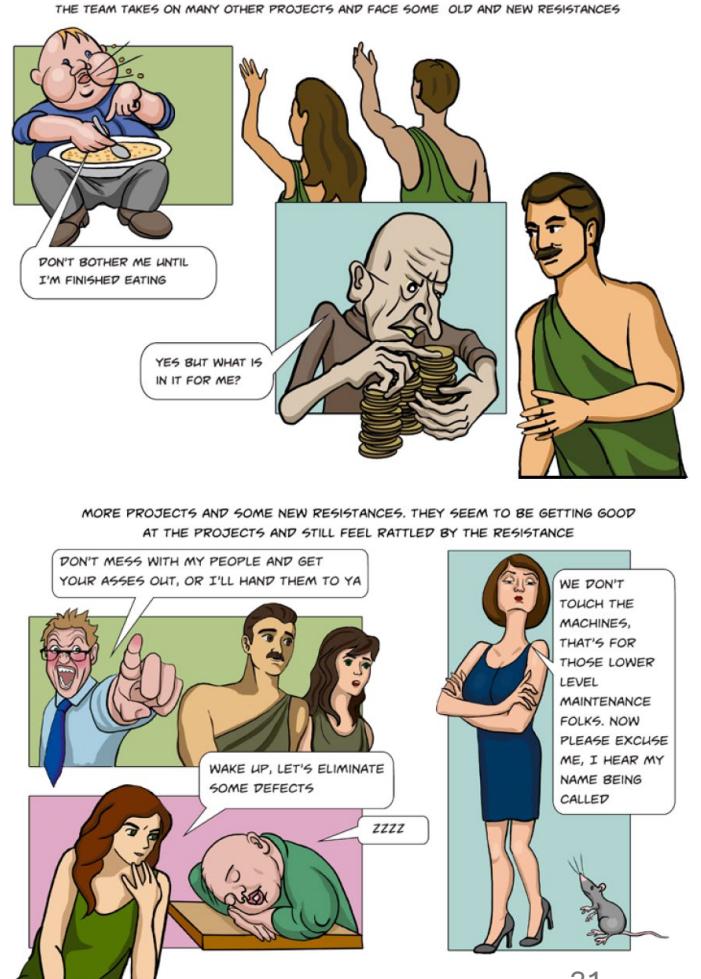
## Teach the children



## The concepts are fascinating



## We deal with a microcosm of life



# Admit it- Getting dirty (and getting paid for it) is way fun!



# Gender Disparity Male-Dominated Field: The industrial maintenance sector has a significant gender imbalance, which may discourage women from entering the field.



- **Not many female role models or mentors.**
- **Let's face it, in some places women are still not entirely welcome to maintenance**

# Where are the women?

## What can we do?

- Outreach to schools
- Awareness of both conscience and unconscious bias
- Ensure good accommodations like locker rooms and bathrooms that are not disgusting

## Recognition that women

- Have as good or better fine motor skills
- Typically, not interested in showing off dangerous ways of working
- Tidier
- Can tolerate close in activities better



# Misunderstanding of the Job of maintenance

## Where did we get our misconceived ideas about maintenance?

- Go back 100 years and think about the grease monkey maintenance man.
- Think dirty, smelly, sweaty, dank, dark, work in the bowels of the building, alone.
- Go back 50 years and think about the hero that saves the submarine or airplane with gum wrappers and bobby pins



Maintenance at  
Solectron- vendor  
for Cisco Systems

## Maintenance today is quite different

- It is about management of the tools we use to make money or provide service
- It is about actions we can take to avoid the need for repair.
- It is about detecting subtle signs of the beginning of the failure cascade.
- It is about solving repetitive problems permanently.
- It is about working in teams of people with different expertise

# Generational Differences in attitudes toward work.



- Maybe we could design the jobs with more flexibility
- Think through what a modern family needs –design the job to provide it.
- Gen Zers want to be safe, have fun, and make a positive impact on the world. They also want flexibility, work-life balance, and opportunities to develop their skills.

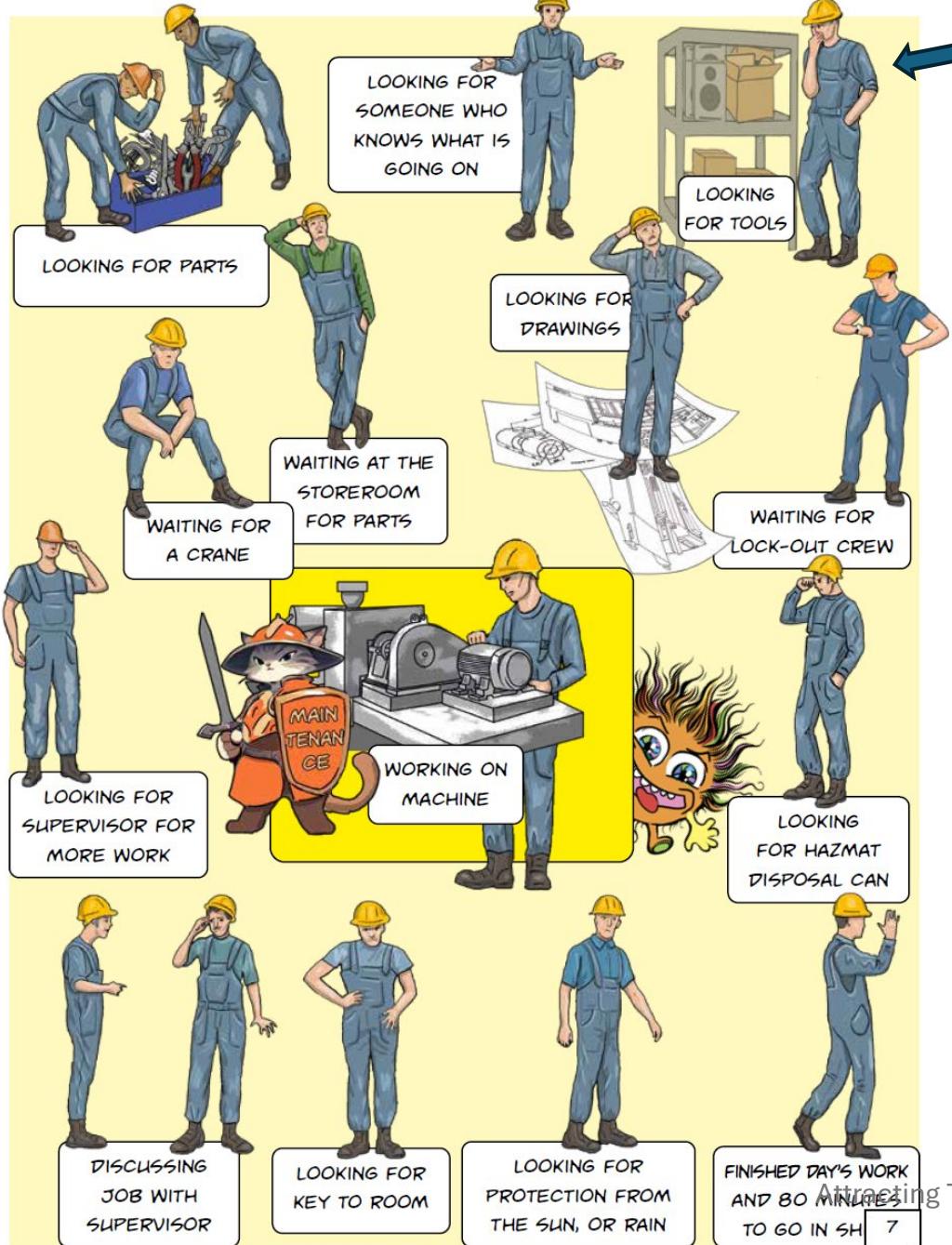
# Adapt to the needs and wants of new workers

## A few statistics

- 76% of undergrads say guaranteed hours or job security would make them more likely to apply to a job
- 22% of undergrads see student loan repayment support as an essential employer benefit, and an additional 51% say it's important
- 87% of undergrads say learning and development (L&D) benefits are either important or essential when evaluating a job opportunity
- 63% of undergrads say developing advanced skills in their field is essential to their definition of career success
- 70% of undergrads are more likely to apply to a job that offers schedule flexibility
- 78% of undergrads say having a sustainable work-life balance is essential to their definition of career success
- 80% of undergrads are highly or somewhat worried about burnout once they start a professional career
- 65% of undergrads would not apply to a job if the employer's values didn't align with theirs

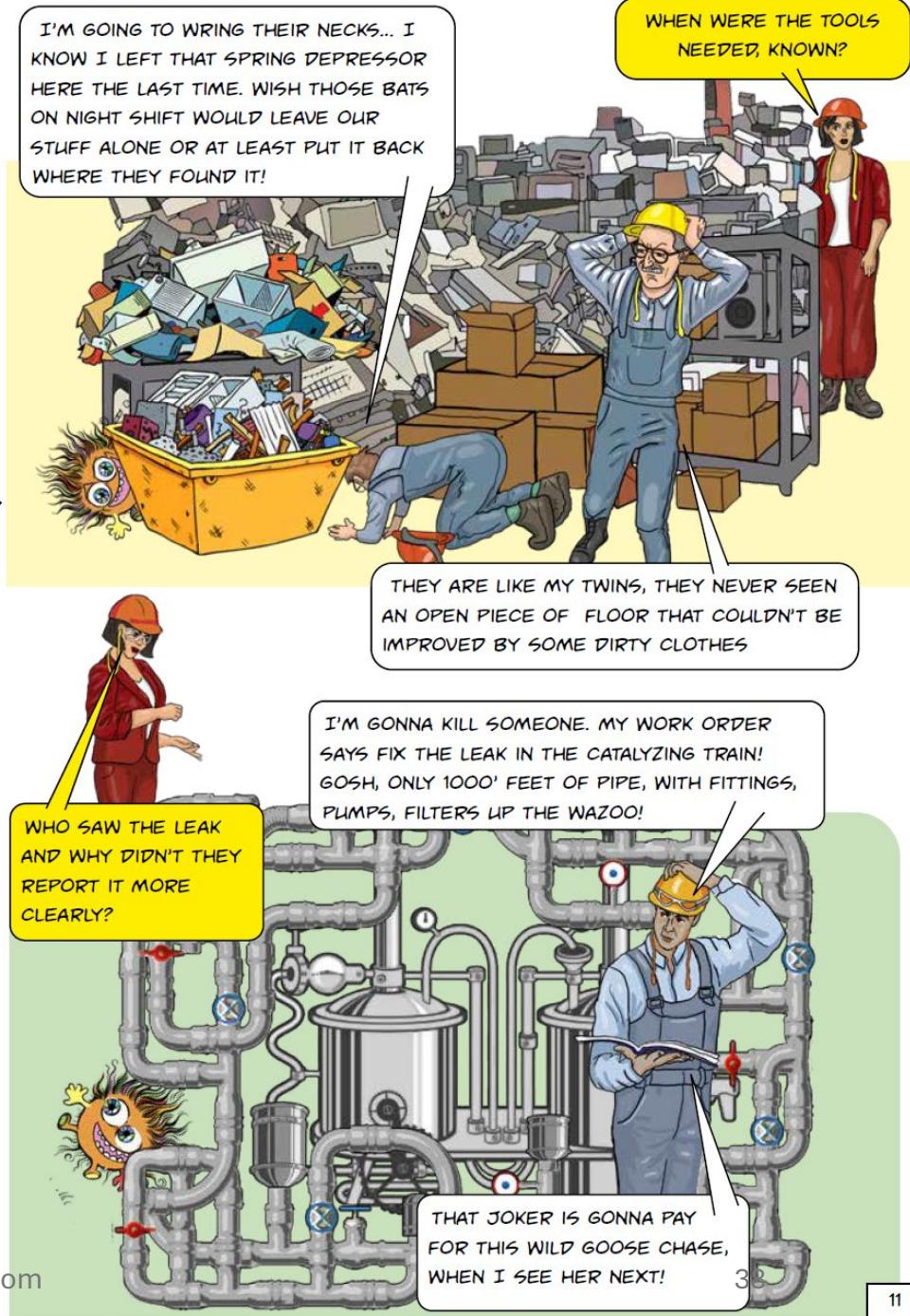
Thank you to: <https://joinhandshake.com/blog/employers/6-things-gen-z-wants-from-their-job/> for statistics!

# DLMH (DAY IN THE LIFE OF A MAINTENANCE HUMAN)



The life of unplanned maintenance people is frustrating

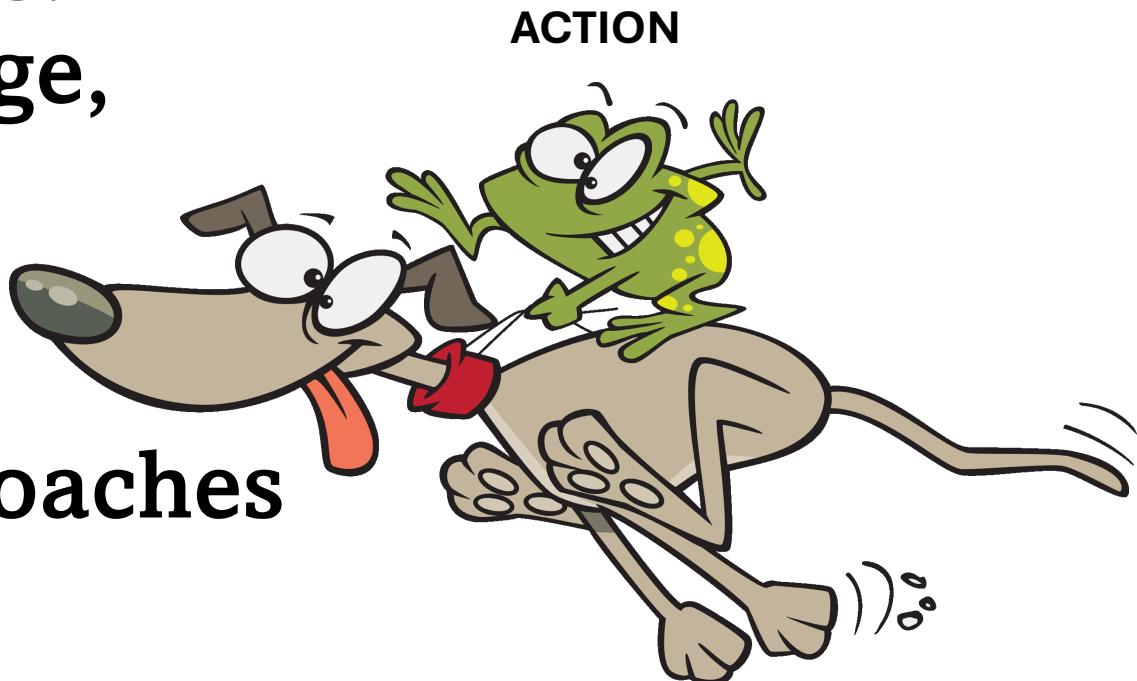
Planning is simply answering 13 questions.



**1** We discussed 8 things that explain what is happening. You should test this by asking questions of prospects

**2** We started to look at actions:  
Education, modernize the image,  
Recruitment campaign,  
Apprenticeships

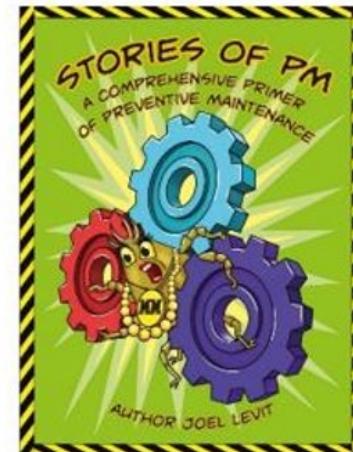
**3** We discussed targeted approaches



# What we are doing



You can tell from the covers these books are different than everything else you've seen.



Preventive Maintenance



Defect Elimination



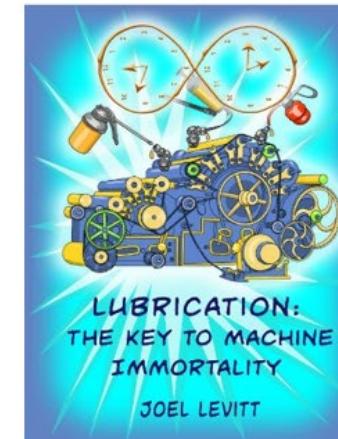
Reliability and fundamentals



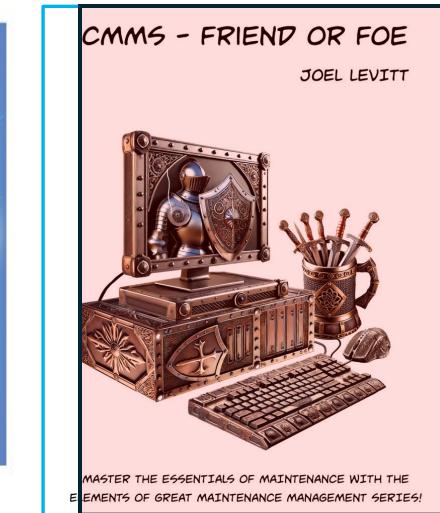
Maintenance quality



Maintenance Planning



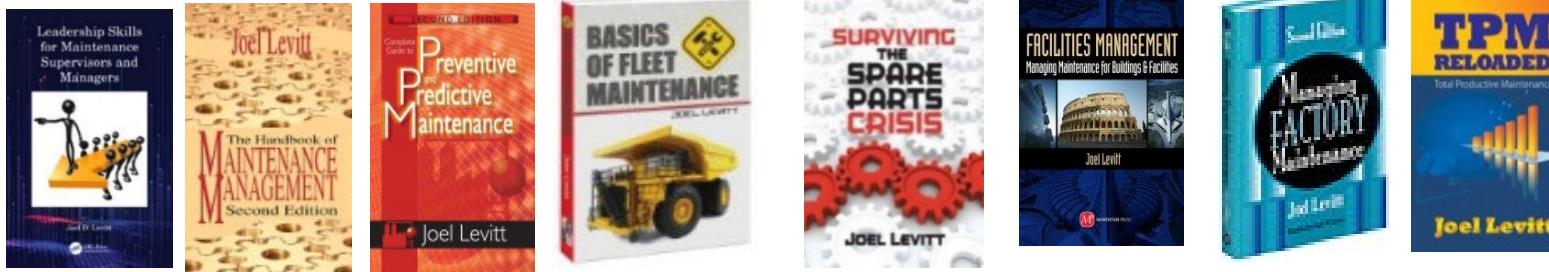
Lubrication



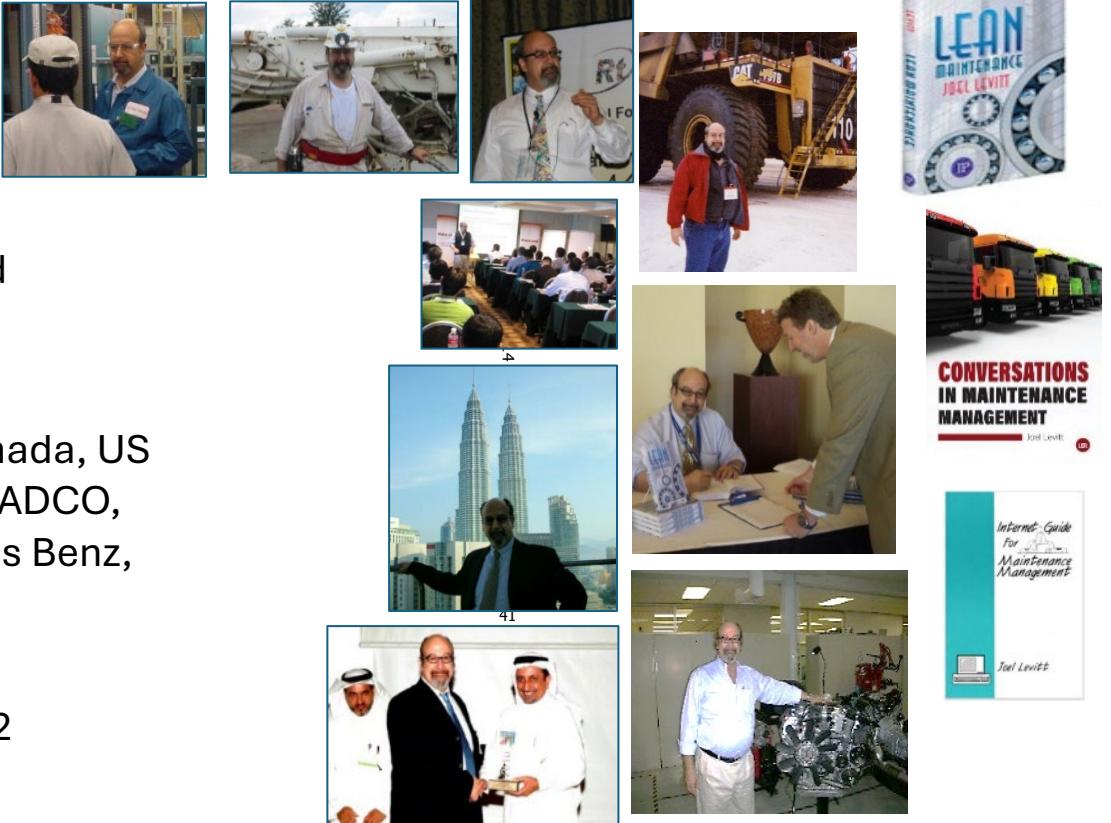
# SERIES AUTHOR:

## JOEL LEVITT

CMRP, CRL, CPMM, PROSCI CERTIFIED  
CHANGE MANAGEMENT PRACTITIONER



- President – Springfield Resources
- Past Director for International Projects, Life Cycle Engineering
- Past Director of Reliability Projects, Reliabilityweb.com
- Over 35 years of experience in global maintenance management and reliability consulting.
- Worked with such global corporations as:
  - Alcoa, Toronto Airport, Newfoundland Hydro, GE, Iron Ore of Canada, US Steel, City of Edmonton, Syncrude, ARAMCO, Lockheed, SABIC, ADCO, BP, Exxon, BHP, Malawi Power, CISCO, General Motors, Mercedes Benz, Pepsi, Abbotts, US Coast Guard, US Army, US Navy...
  - Author of 20 books plus 2 collaborations and 200+ articles
  - Trained 20,000 maintenance professionals in 550+ sessions in 42 countries
  - Favorite charity Kiva.org, micro lenders to small business worldwide



You can tell from the covers these books are different than everything else you've seen.



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# Now it is your turn...

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- Thank you for your attention
- Please visit us at [WWW.MaintenanceTraining.com](http://WWW.MaintenanceTraining.com)

