UNDERBODY CORROSION SYMPOSIUM

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AS A SERVICE TO THE TRUCKING INDUSTRY

UNDERBODY CORROSION

NO ONE'S FRIEND….

1. What is Underbody Corrosion?
2. How does Underbody Corrosion impact the bottom line?
3. What can be done to reduce its expensive and damaging impact to the Trucking Industry?

WHAT IS UNDERBODY CORROSION?

Underbody corrosion can be defined as the aggressive degradation of metallic and non-metallic surfaces of tractors, trailers, and other vehicles exposed to sodium chloride crystals (road salt) and the mixture of sodium chloride and magnesium chloride liquid brine solutions sprayed on roadways during inclement winter weather.

THE ENEMY OF STEEL IS RUST

WHAT IS RUST?

WHAT IS RUST? OPINIONS?

- Brownish-red or white fungus?
- Steel Cancer?
- Is it chemical, physical, or imagined?

Rust can be defined as: **Any of various powdery or scaly reddish-brown or reddish-yellow hydrated ferric oxides and hydroxides formed on iron and iron-containing materials by low-temperature oxidation in the presence of water. Huh?**

1. **Any of various metallic coatings, especially oxides, formed by corrosion.**
2. **A stain or coating resembling iron rust.**
3. **Deterioration, as of ability, resulting from inactivity or neglect.**
4. ***Botany*a. Rust fungus.**
5. **A plant disease caused by a rust fungus, characterized by reddish or brownish spots on le aves, stems, and other parts.**
6. **A strong brown.**

RUST – A SIMPLE CHEMICAL DEFINITION

Steel's enemy is rust

- Rust can and will form on steel surfaces- unless the steel is-protected. Figures 1 and 2 show how corrosion attacks an uncoated steel surface.
- A piece of steel may appear smooth to the naked eye; however, a microscope shows that it actually is a very irregular surface. These drawings are representative of highly magnified cross-sections of a steel surface.
- The peaks and valleys of this irregular surface are electrically anodic (+) and cathodic (-) in relation to each other, as indicated in Figure 1.

- Similar electrical potentials are caused by mechanical stresses on the surface or by the entrapment of foreign particles, such as carbon, silica, road salts, brine etc. With the addition of moisture, the adjacent anodic and cathodic areas pair up to form micro electrolytic cells.
- Figure 1 shows what would happen as a result of the electrical current between the anodic and cathodic areas in these micro cells.
- Iron would be carried away from the anodic areas-- thus causing pits to develop, and iron oxides (rust) would accumulate in the surrounding cathodic areas.
- The rust, which has an alkaline reaction with moisture, would diffuse to put an even larger area in an alkaline condition.
- Left untreated over time, the occluded rust “sites” would take over eliminating ALL ferrous material; in other words, the steel would dissolve.

FIGURE 1

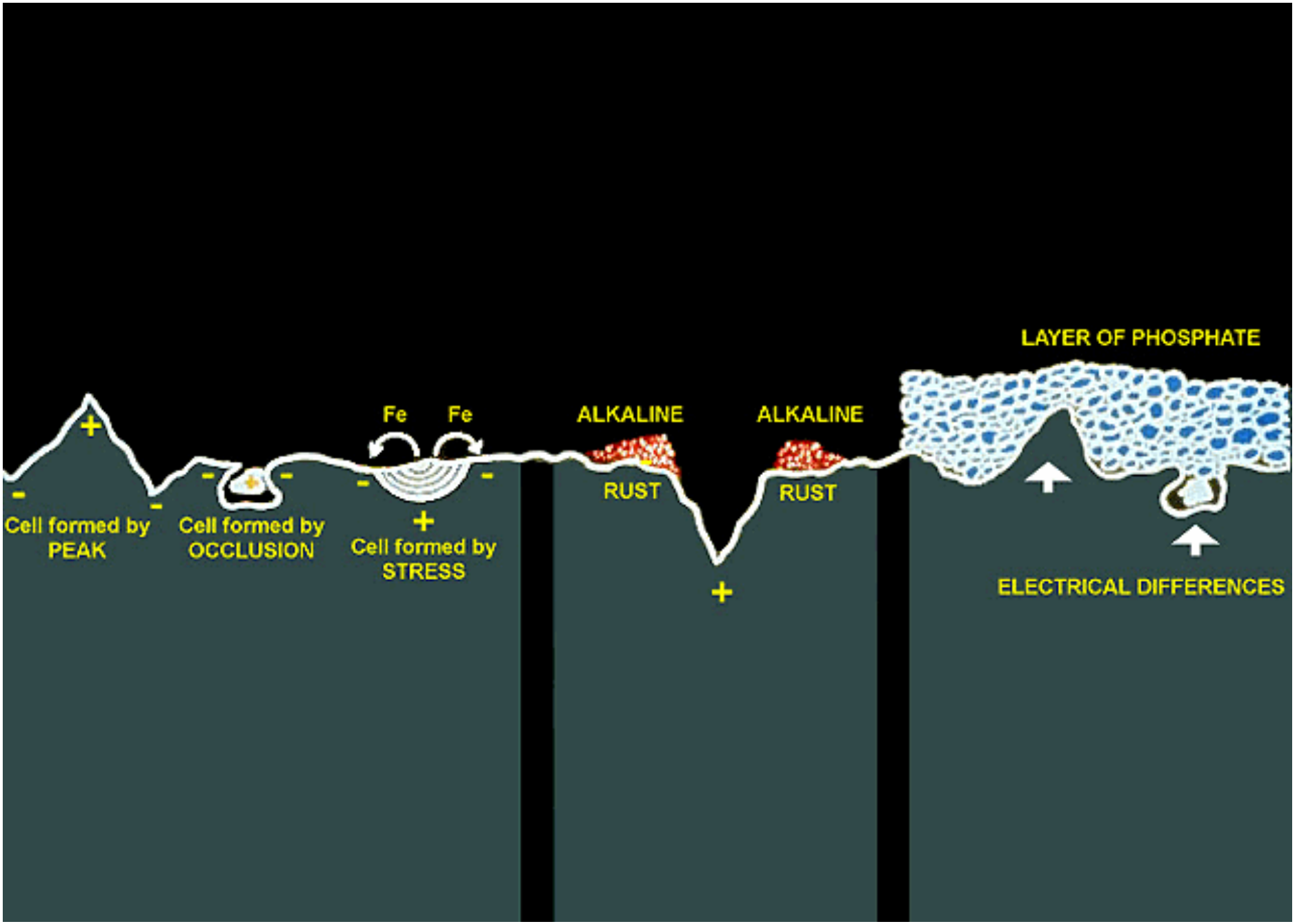
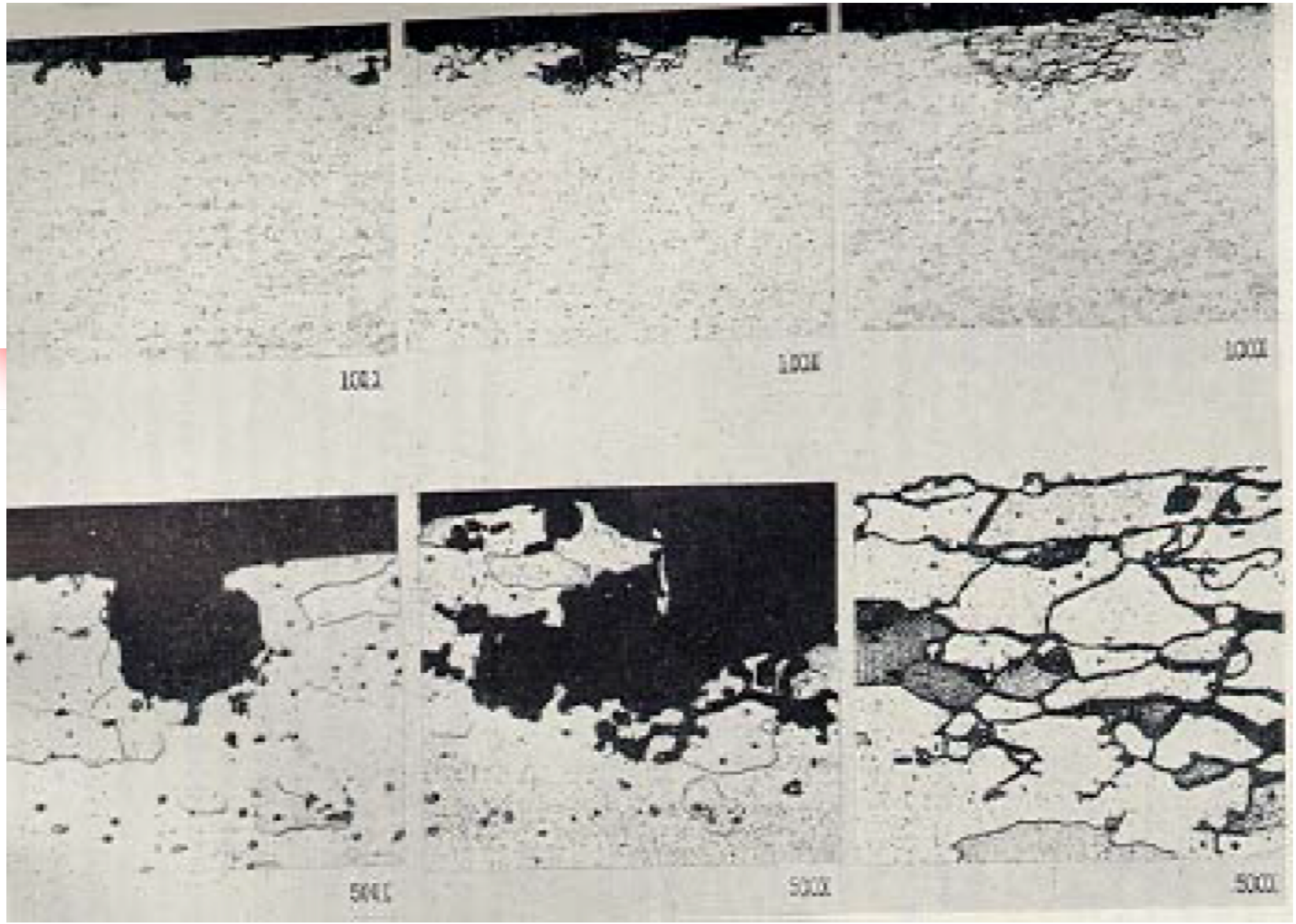

LAYER OF PHOSPHATE
Fe
Fe
ALKALINE
ALKALINE
RUST
RUST
Cell formed by PEAK
Cell formed by OCCLUSION
Cell formed by STRESS
ELECTRICAL DIFFERENCES

FIGURE 2 - STAGES OF CORROSION



UNDERBODY CORROSION

WHAT IS THE PRICE $$$$$ TAG TO THE TRUCKING INDUSTRY?

- Transport Topics in their November 2018 edition reported that Underbody Corrosion resulted in a cost of repair or replace for key vehicle components of over…..

ONE Trillion Dollars

WHAT?

WHO PAYS?

HOW DO WE DEFEND OURSELVES?

WHAT DOES THE MARKETPLACE OFFER TO THE TRUCKING INDUSTRY?

- OEM/Coatings Companies new developments.
- Aftermarket short-term corrosion prevention coatings.
- Underbody short-term corrosion prevention coatings applied using fleet wash systems.
- Parts store aerosol spray coatings.

"Much of the responsibility for rust prevention falls on carriers to perform proper maintenance, but fleets must rely on OEMs to provide the platform to start off with, Wacker said. We work with OEMs to make sure they put a good quality product onto these open areas." TTopics 11/20/2018

"**Frequently washing vehicles — at least after each salting event**— is the most important anti-corrosion maintenance procedure, the experts agreed. Thorough inspections are equally important to spot and stop rust before it grows out of control." Ttopics 11/20/2018

OEM ANTI-CORROSION EXPECTATIONS

How Can Fleets Make Sure What They Are Purchasing Is Properly Protected?

- Learn/ask for simplistic training from OEM suppliers or seek advice from other Industry professionals specific to surface treatment coatings and their related application systems and procedures. Create a minimum expectation the OEM must live up to.
- Arrange OEM plant tours 1x-2x annually and during the tour pay specific time and attention to the OEM's finishing system. Ask to see process control records or their wash and coating systems, salt spray results, humidity resistance results, etc. **Trust but VERIFY**.
- Be open and provide the OEM with any coatings related failures or concerns to OEM's that produce specific underbody related components such as trailer manufacturers. The more information the OEM has at their disposal the better coatings companies can work to develop more and better protective coatings for our Industry. The more WE know and understand about underbody anti-corrosion coatings the quicker the $ONE TRILLION number becomes smaller.
- Work with your fleet wash suppliers to determine what they/their chemists offer or can create that can be sprayed onto the underbody areas each time vehicles are washed. New and exciting technologies **DO EXIST** that can make significant reduction impacts upon the occurrence and frequency of underbody corrosion.

THANK YOU!!

FOR YOUR VALUED TIME AND ATTENION

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