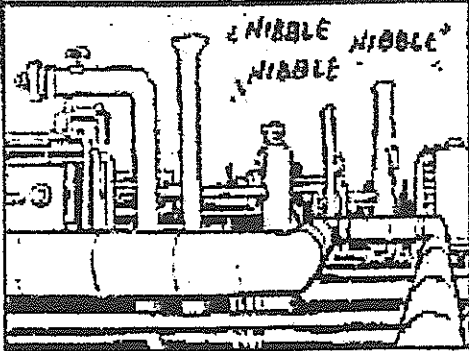
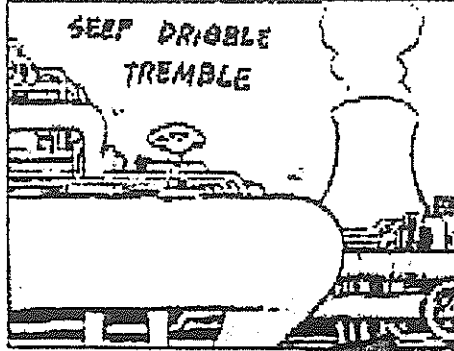


DON'T LOOK NOW... BUT OUR INFRA-STRUCTURE IS BEING EATEN FROM INSIDE LIKE A TERMITE-INFESTED STUMP...



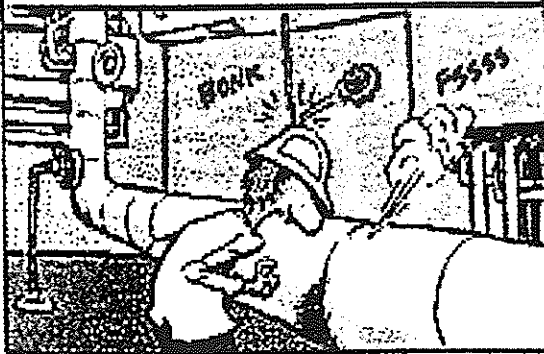
WHEREVER LIQUIDS FLOW IN PIPES, BUBBLE IN CHAMBERS, OR FERMENT IN VATS... IN BREWERIES, BOILERS, NUCLEAR POWER PLANTS...



HIDDEN PITS AND CREVICES ARE FORMING...



SADLY, CORROSION IS A MURKY, CRYPTIC PROCESS. ENGINEERS KNOW WHERE IT'S LIKELY TO HAPPEN, BUT THEY DON'T KNOW WHEN OR HOW FAST...



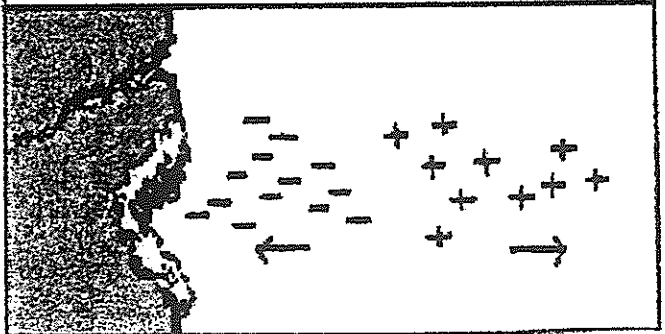
TO SEE CORROSION, YOU EITHER SHUT DOWN A SYSTEM AND TAKE IT APART, WHICH COSTS A FORTUNE, OR WAIT FOR A FAILURE, WHICH COSTS A FORTUNE.



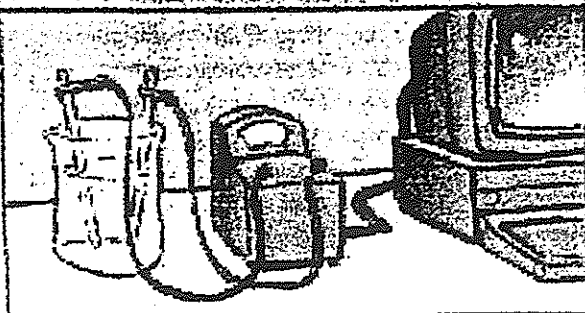
NOW AT WASHINGTON UNIVERSITY IN ST. LOUIS, CHEMICAL ENGINEERS XUE-DONG DAI, RODOLPHE ROTARD, AND BABU JOSEPH ARE APPLYING A NEW MATHEMATICAL TECHNIQUE TO DETECT CORROSION WHILE IT IS HAPPENING.



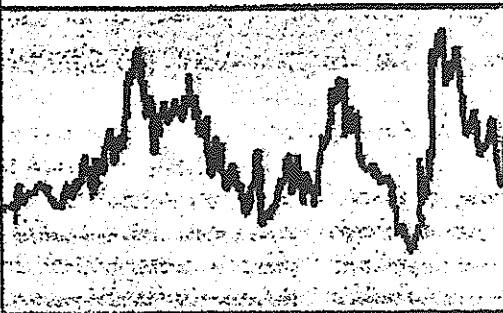
CORROSION IS AN ELECTRICAL AS WELL AS A CHEMICAL PROCESS. WHEN METAL CORRODES, CHARGED PARTICLES ARE MOVING AROUND, SIMILAR TO WHAT HAPPENS INSIDE A CAR'S STORAGE BATTERY.



DAI, ROTARD, AND JOSEPH IMMERSED TWO STEEL RODS IN AN ELECTRICALLY CONDUCTING SOLUTION OF SALT WATER OR ACID. THESE WERE WIRED TO A VOLTMETER AND MONITORED BY COMPUTER.



AS CORROSION PROCEEDED, THE COMPUTER RECORDED THE FLUCTUATING VOLTAGE BETWEEN THE RODS--A WILDLY IRREGULAR SIGNAL, SINCE CORROSION ITSELF IS IRREGULAR.



THE QUESTION IS: ARE THERE HIDDEN PATTERNS IN THE SIGNAL THAT BETRAY MAJOR CORROSION EVENTS LIKE THE FORMATION OF PITS AND CREVICES?