

HANFORD ATOMIC PRODUCTS OPERATION  
EQUIPMENT MAINTENANCE

Mr. Chairman, and Gentlemen: Let me express my appreciation for your invitation to present to you some of the factors, methods, and unusual aspects of equipment maintenance at Hanford Atomic Products Operation.

Much has been said, written, and guessed at concerning the colossal, hush-hush operation at Hanford. It is not my purpose to describe here its construction, operation, or part in the scheme of our National Defense. Virtually everyone in this part of the country knows the general location and purpose of the Plant; they know that it is a vast works, sprawling around the center of a huge 620 square mile reservation large enough to cover half of the state of Rhode Island. They also know that it is shrouded in a tight veil of security. It has been said that the fingers of two hands are probably enough to count the men who know the details of all departments.

It is also questionable to me whether more than an equal number are fully familiar with the magnitude and functions of the Transportation Section in its operation and maintenance programs. To be so posted, one would have to be familiar with virtually every form of transportation service characteristic of this part of the country, or which involves transportation.

Men in your business need only to look at the line organization and variety of functions to grasp the scope and problems of such an operation. Similar functions exist in towns and industrial communities; but, rarely in such combinations.

Mr. M. F. Rice is Manager of the Transportation Section. Reporting to him are three superintendents of Bus and Rail Operations, of Railroad Trackage and Roads, of Equipment Maintenance, and finally, a supervisor of Records and Equipment Control.

The Bus Operation includes a city bus system for a community of 25,000 population. It also includes an interurban or Town to Work shuttle system which carries a majority of employees to widely separated factories, on a seven-day, round-the-clock operation.

The Rail Operation delivers loaded cars and returns empties to two interchange yards at opposite ends of the Plant, for connection to three commercial railroads. 152 miles of trackage make up the system.

The Track and Road Maintenance Unit maintains 152 miles of track to standards of Class I railroads, and 250 miles of paved highway to standards of the Washington State Highway Department. In addition, some 600 miles of gravelled roads are maintained. The work covers all phases to include rock crushing, seal coating, sanding, and manufacturing of black-top. Other groups in that unit operate several crawler cranes, motor cranes, dozers, and myriads of construction type equipment as needed. A trucking system makes load and part load, door delivery, of manufacturing parts, express,

lube and inspection. Such equipment is routed to a lubrication point, and



pipe, lumber, acids, and other package goods to average 24 tons daily, and other trucking as requested quite frequently.

The Equipment Maintenance Unit has responsibility for maintenance of all mobile equipment at Hanford. Let us briefly take a quick look at the amount and types serviced by that unit. We must note here that we are excluding all equipment used and serviced by construction personnel.

There are approximately 2,300 units of equipment in use, which includes hundreds of different models, and represents products of over 130 manufacturers. City and suburban passenger buses, railroad locomotives, local and long distance trucks from jeeps, pickups, semi-trailers, and up to 75-ton rated capacity lowboy trucks and trailers. There are sedans, panel jobs, station wagons, scooters, police equipment, and emergency vehicles such as ambulances and fire trucks normal to any community of twenty-five to thirty-thousand population. We have the usual concrete batch truck, trash collectors, street and highway maintenance equipment. Bulldozers, cranes, rock crusher, asphalt plant, compressors, scrapers, and what will you have make up the balance.

A few additional figures might help to visualize the extent of necessary maintenance. During 1951, the 94 buses made 138,001 trips, and carried 2,171,142 passengers; the eight locomotives handled 30,096 railroad cars, which, if coupled together, would reach from Walla Walla through Portland, and well on toward the coast. The system used 1,305,601 gallons of gasoline, 613,016 gallons of diesel fuel, and 171,095 quarts of motor oil, which is enough petroleum product to cover a football field to a depth of five and one-half feet.

All the equipment must be maintained at a high level in order that maximum efficiency and availability can be expected from each unit. A foolproof system had to be worked out so that equipment could be maintained in as near new condition as possible.

t

From meetings similar to this one, from articles in trade journals to which some of you may have contributed, from accurate records and experience, four distinct types of preventive maintenance inspection programs were evolved.

The first of these is called the "B" inspection, which is tied in with regular lubrications. Light equipment such as sedans, pickups, jeeps, etc. are lubricated and inspected on a 2,000 mile or 90-day period, whichever comes first. This same inspection is made on all trucks, but, due to heavier usage it is necessary that they be lubricated every 1,000 miles or 30-day period.

So that we have absolute control over these lubrications and inspections, each unit has an inspection record attached to the left front door, which gives the date of the latest inspection and lube job. When a unit enters one of our service stations for fuel, the first duty of the station attendant is to check the card, and to refuse service if the vehicle is overdue for lube and inspection. Such equipment is routed to a lubrication point, and



a relief or replacement vehicle issued, if necessary. That system is as tight as we can make it, and gives assurance that equipment is not abused through lack of lubrication or small repairs. The "B" inspection covers 49 items to be checked along with each lubrication.

A Class "A" inspection is made at intervals of 10,000 miles or 15 months, whichever occurs first on sedans and other light equipment. Trucks, semi-tractors and other equipment of over one-ton capacity are "A" inspected at 5,000 miles or 6 months. The inspection record card attached to the door forms the control record, by simply showing the required number of "B" type inspections or lapse of time.

The "A" inspection is broken down into 28 sections which list a total of 212 inspection items. If, during this inspection any one of the main assemblies is found in sub-standard condition, necessary repairs are accomplished at that time. When the vehicle is released for service after an "A" inspection, it is in standard, safe operating condition.

A third preventive maintenance inspection and service concerns diesel powered, or area buses, only. The program was adopted after extensive study of vendor recommendations and local operating conditions. Diesel powered buses are inspected every two weeks with coverage on 74 items in the diesel engine, electrical system, chassis, and brake system. A complete lubrication and Class "B" inspection is given each 2,000 miles, and includes taking a sample of crankcase oil. Samples are analyzed by the Faber Laboratories. Their recommendations are closely followed. This service is beneficial to the detection and correction of crankcase dilution, bearing and cylinder wear.

At 20,000 mile intervals, a comprehensive and detailed inspection is made which includes items checked on the two previous inspections. This inspection begins with a road test for observation of the coach operation, and is followed by removal of wheels for drum and lining inspection and repacking of wheels. Final drives and the diesel power unit are also checked.

Bus runs are rotated to vary accumulated mileage and to provide an even flow of work through the shop.

In the railroad shop, locomotives are serviced and inspected in compliance with standards established by the American Association of Railroads, to include a daily report and minor adjustments. A monthly check is made of all mechanical, electrical, and air equipment, with a crankcase sample sent to Faber Laboratories. An annual inspection is made to include hydrostatic tests, and all safety features.

The four repair shops are widely separated. The automotive and heavy equipment shops are in Richland proper, while the railroad shop is 38 miles distant, at Riverland. Small shops with one or more mechanics are located in manufacturing areas. In those shops minor repairs are made to units assigned to that area, while major inspections and repairs are brought to the Richland shops.



The widely dispersed facilities pose problems in scheduling of work, tooling, and specialized equipment. Inevitable duplication exists in providing proper tools and equipment for each shop.

One of the four facilities is located in the center of Richland. Here all major repairs and Class "A" inspections are made to vehicles of one-ton capacity and under. All radiator, speedometer, fuel tank repair, and battery work for Transportation Section installations is done here, on a 2-shift, 5-day week.

The second facility, in the north end of town, performs major repairs and "A" inspections on general purpose vehicles over one-ton capacity. These include buses, trucks, and special purpose vehicles such as fire engines, line trucks, armored cars, and other heavy vehicle maintenance. Here also is done all engine rebuilding, carburetor, distributor, fuel pump, air compressor, electrical unit, clutch and brake equipment work. Small structures adjacent to that garage house facilities for welding, equipment fabrication, glass and upholstery work. The garage operates on a round-the-clock, 7-day week, while the auxiliary shops work an 8-hour, five-day week.

A heavy equipment shop in the south end of town restricts its repairs to heavy equipment such as tractors, cranes, compressors, shovels, and road maintenance equipment. It operates on an 8-hour, 5-day week.

The fourth shop, the railroad repair facility, performs major and minor repairs and inspections on diesel locomotives and normal complement of plant rolling stock.

Only one of these four shops was originally designed for present use. Two are merely wallboard over wooden frame construction. They have pits instead of hoists, and have long been considered outmoded, inadequate, and a great handicap to the successful prosecution of the maintenance program. This brings us to a consideration of our new Consolidated Transportation Facility.

A new Consolidated Transportation Facility, which was scoped and planned by General Electric is currently under construction by the Atomic Energy Commission and is scheduled for occupancy in November, 1954. Strictly utilitarian in every detail, it is designed for our specific requirements, with sufficient capacity to handle foreseeable increases.

Perhaps you might be interested in the general floor plan and unusual features of the new facility. Here is a rough outline sketched to show the conveniences designed into it.