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MAINTENANCE, REPAIR, PACKAGING AS A FACTOR IN DISTRIBUTION AND OPERATION

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CAPTAIN WORTHINGTON:

The speaker this afternoon is Major General Plank. Prior to entering the U. S. Military Academy, General Plank served for two years as a Private in an Infantry company.

He was graduated from the Academy in 1920; from the Engineering School, Basic Course, in 1921; from the Civil Engineering course in 1922; from the Air Corps Primary Flying School in 1927; and from the Command and General Staff School in 1940.

June 1942 found him in England as Deputy Chief of Staff, Services of Supply. He commanded the Eastern Base Section in England from September 1942 until December 1943 when he became Commanding General of the Advanced Base Section, a job he held throughout the campaign on the Continent. He then moved to the Pacific, where he remained until the war's end. He is now Commanding General of the New York Port of Embarkation.

The subject of General Plank's talk is, "Maintenance, Repair, Packaging as a Factor in Distribution and Operation."

GENERAL PLANK:

I acknowledge with appreciation the confidence and trust bestowed upon me by General McKinley in arranging that I should undertake this lecture on Conservation, Maintenance, Reclamation and Packaging as functions of Distribution. It is indeed an honor to be so selected.

Such qualifications as I may have for this task arise from Command experience in World War II in England, on the Continent and in the Philippine Islands as Commander of Base or Advance Sections. My comments spring from the viewpoint of a supply organization in the field. In it there is nothing new. My idea is to emphasize a point of view, an attitude, an enthusiasm for matters in themselves simple, obvious, generally well known.

I understand you are concerned fundamentally with procurement and distribution--to procure what is needed for war and to distribute this materiel in the right quantity, to the right unit, at the right time and place. Many,

many factors affect distribution and, in turn, procurement. Of these, I shall attempt to present four, the first of which is Conservation.

Conservation may be defined as the economical, proper and effective use of equipment and supplies, or negatively, as the avoidance of waste or misuse of materiel. Its keynote is discipline--that aspect of discipline which we call supply discipline.

To effect conservation requires, first of all, having a specific idea and then following through with the necessary Staff and Command work to make it effective.

To take an example - in England in 1943, the American Forces were criticized for the waste of food - the idea immediately arises: "Stop wasting food." This negative idea was converted into the positive: "Save food." Staff study produced properly conceived and balanced procedures, and orders were issued. Supervision followed to effect understanding of and compliance with those orders. The result was a complete stoppage of waste - yes, and a positive saving, measured in the Eastern Base Section by an actual drawing of rations below those authorized by 7% through a sustained period of months and related to units performing hard physical work. The belly of no soldier was robbed, as we were better fed after than before. This saving can easily be shown to have been hundreds of tons for an organization as small as one static base, and thousands of tons for the SOS, European Theater as a whole.

There was a price for this accomplishment - the price of hard work and eternal vigilance by all Commanders. It required that each soldier be schooled to know, understand and believe in the idea. Messes were changed to cafeteria style with the soldier helping himself. For everyone, the rule was: "If you take it, you eat it." Mess Sergeants were told how to best utilize foods, some of the new kinds, such as dehydrated eggs and potatoes, being rather difficult to handle. Preparation of left-overs in an inviting and appetizing fashion was emphasized. Kitchen waste, as such, was eliminated. GI cans were no longer needed for waste - the #10 can was substituted.

This program was in general use in all Bases in the ETO at the time. General Rogers ran the famous "Willow Run" cafeteria for Officers in London with what was claimed to be, literally, no waste. This must be regarded as a distinct achievement, if we believe the frequent statement that officers are usually more guilty of this type of waste than anyone else, and if we remember the kitchen troubles an operator must have with wartime civilian help. I judge from some of the tough letters General Rogers wrote that this record of no waste was, literally, correct.

Another idea on conservation arose from the observation that too many trucks were running the highways empty. The fault was waste of transportation. The idea: get a "pay-load" for each direction in a truck turn-around. After proper staff study and appropriate issuance of orders, this became a drive to develop the "return-load" principle. Again, the price was hard work for all commanders and for a small group of men assigned to operate a central clearing agency for authorizing all truck movements and allocating cargo known to require movement. The saving in truck miles was great, but perhaps more important was the training of truck unit commanders and operators who thus acquired, for the first time in their experience, the "know how" to really capitalize the means provided their organization, and used this knowledge so effectively in the real show in the days of the Bulge in France, and in the final weeks before the German collapse in 1945.

Other examples could be compounded--the British saving of gasoline by no use, two days per week, of automotive equipment; the saving of telephone lines by learning to keep long-distance calls short (knowing in advance what you were going to say, saying just that, and hanging up); the growing of food by a program which might be called "Every unit raise a garden," which in one growing season in England produced 60,000 dead-weight tons of food. "Brussel Sprouts" But it all comes back to a willingness and capacity to understand and accept supply discipline. I wonder whether you believe large-scale black market operations could exist in an Army truly disciplined in supply, truly conscious of their supply responsibilities? I submit that conservation, or shall we say supply discipline, is as fundamental and vital in our operations as is the basic discipline of combat soldiers.

Maintenance is the next topic, one with which we are all familiar. I presume that this has been vital in every army, in every war. The higher echelons of maintenance, 3rd through 5th, accomplished by T/O units, is a direct problem in organization, equipment, operation and management. These echelons of maintenance have leaders, unit commanders whose units have no reason for existence apart from performing maintenance. The problem here is the normal one of training and command.

I would like to discuss preventative maintenance - old-fashioned first echelon - performed by the individual soldier wherever he may be. Preventative maintenance has such a broad potential impact on procurement as to make it unlikely its importance will be overstressed. Its implications are almost without limit. From a collection of English Proverbs by George Herbert, published in 1640, we have:

For want of a nail, the shoe was lost;
For want of a shoe, the horse was lost;
For want of a horse, the rider was lost;
For want of a rider, the battle was lost;
For want of a battle, the kingdom was lost;

All for the want of a horse shoe nail, which one might correctly charge off to inadequate first echelon maintenance.

Preventative maintenance relates to every item of equipment and supply, regardless of time or location. Preventative maintenance concerns, and is a part of the responsibility of every person in uniform, again regardless of time or location. If those two ideas could be really "sold," distribution and procurement would be simplified, certainly quantitatively.

Perhaps the essence of preventative maintenance is the fact that it has to be sold as the definite responsibility of every person as something "in addition to his other duties." And the individual cannot really respond without accepting responsibility. Take preventative maintenance as applied to automotive equipment. The Unit Commander assigns drivers to trucks - the truck driver performs first-echelon maintenance on his truck as defined by appropriate technical regulations. It becomes the driver's responsibility t do these things thus prescribed, but this is merely the beginning. To really make preventative maintenance effective, the unit commander must truly "sell" the idea:

He appeals to pride and fixes responsibility at one stroke by assigning, permanently, the truck to the driver, "marries them" so to speak; the soldier goes out with no other truck and, in turn, the truck goes out with no other man. The soldier takes pride in making his truck the best.

The Unit Commander explains procedures simply. The fine print on the reverse side of the trip ticket which describes driver maintenance is too infrequently read. The Unit Commander prepares and gives his drivers his own copy of essential instructions.

DISPLAY CARD

He applies adequate supervision, by training the unit to perform preventative maintenance at the regularly scheduled, semi-military formation, daily, at the prescribed hour. And through NCO and his own supervision, assures quality in performance.

The Unit Commander utilizes the traditions of well-trained soldiers of history by describing the care given his mount by

the cavalryman of not so long ago. First of all, the soldier and the horse were assigned to each other. The cavalryman cared for his horse first - himself, second. This was done at a regularly scheduled formation called "Stables." The officers and NCO leaders were there, of course, and the care of animals was superior because the system encompassed all basic principles. So our wise unit commander takes a leaf from the past and calls his formation for first-echelon maintenance of trucks "Motor Stables," and "connects it up" for the modern mechanized soldier.

And then he plays his trump card; he tells the driver to avail himself of every opportunity such as halts, stops, any waiting period, to check up on his car, his truck, and give it required attention at every such opportunity.

Driver maintenance is augmented by regular periodic checks - 1,000 miles and 6,000 miles, and when all of these elements were actually combined in a given unit, the very best in preventative maintenance was obtained and many units were truly great in this respect. Some were truck companies, ambulance companies, provisional car companies. Some were named by soldiers, British civilian men and by British women. Under such conditions, results are always favorable:

1 - Equipment is ready to run and percentage deadlined is low.
2 - Demand for parts is minimized.
3 - Demand for higher echelon maintenance is minimized, and here the dividends began to show in terms of savings of units, men, time, supplies, and headaches.

Preventative maintenance is most easily illustrated in its application to mechanical equipment but is really required by all (or nearly all) equipment and supplies.

a - Clothing and equippage - surely, in its initial phase, this is the soldier's job. Benjamin Franklin's rule on first echelon was: "A stitch in time saves nine." That rule is still good.
b - QM Class I in Depots and in Unit messes - use older goods first. Commercial restaurants do this. You probably do it in your home. But I wonder if you really know the effort required to get it done in a unit or depot?
c - Any item - clean, dry storage in depots. Careful handling. Words easy to say, but difficult to effect.

Illustrations could be multiplied many fold.

Reclamation is an intensely interesting item, and the next for discussion. It really starts with the salvage procedure - equipment which has been abandoned on the battlefield or in bivouac areas is gathered by units organized for the purpose, assembled at collecting points and there sorted and classified. Articles which are OK for re-issue are sent to supply points for distribution. The balance is evacuated to salvage or reclamation depots in the Communications Zone and there classified. That which is economically repairable is repaired, and returned to appropriate depots for stock. That which is economically not repairable is reclaimed and this organized, supervised process becomes reclamation.

A relative of reclamation, a little-brother usually born without benefi of clergy, is cannibalization. But cannibalization is seldom organized, supervised, and frequently involves a completely excessive price for a quick, on-the-spot item of supply.

General Thrasher developed in the Oise Base Section, in Rheims, what was probably the largest salvage and reclamation Depot in World War II. It was operated by a QM group. It had several thousand American soldiers. But it also had about 25,000 German POWs, displaced persons of various nationalities, and French civilian employees. It performed work on practically all classes of equipment and supplies, of all Services. It was gigantic. And its value in terms of dollars to the American taxpayer would indeed be interesting to compute, and I venture would run into many millions. This is the greatest performance with which I am acquainted.

Similar activities further toward the front were less elaborate. Uniformally they utilized POW labor and civilian labor locally available. One small activity in reclaiming 2½ ton 6 X 6 trucks at Verdun cost 1 Warrant Officer, 4 Enlisted Men, 96 POWs and carefully and completely reclaimed an average of 8 trucks per day. Others, organized on a strict production line basis, handled as many as 40 2½ ton trucks per day. Here the vehicle to be reclaimed was first of all washed and steamed to remove all dirt and grease, and was then placed on the roller conveyor line. Major Unit and Sub-assemblies, such as engines, starting motors, water pumps, etc, were removed, intact, cleaned, preserved and sent to 5th Echelon Maintenance in the rear near Paris. Fuel pumps, spark plugs, air strainers, windshields and similar items were removed and if OK for re-use, sent to local stock room. Inner tubes and casings were repaired as might be required. Single parts were stripped, cleaned, preserved and sent to local stock room. About the only elements junked were the steel frames themselves.

The reclamation line flow was as steady as a typical assembly line, with each man trained to do his pecurliar part with precision.

The beauty of the operation is its timely production, very close to the point of demand, of a flow of parts and unit-assemblies, so uniformly in short supply. Because these parts and unit-assemblies were delivered to Army supply points daily - if in fact the need was not so urgent as to compel the Armies to come and get them. Under these conditions, for the first and only time, were parts sufficient to meet Armies' maintenance requirements. Again it would be interesting indeed were these values to be tracked by an agency having the time for thorough study, and develop a ton, dollar, or time value for this procedure.

Packaging and packing is the last item for presentation. Packaging includes cleaning, preserving, determination of unit quantities per package, protective wrapping, cushioning, identification marking, and other items up to but not including the shipping container. Packing makes the individual item or package ready for transportation. It includes selection or construction of the shipping container, and the assembly of items or packages therein, with necessary blocking, bracing, weatherproofing, exterior strapping, and marking of shipping container for identification of content.

The successful prosecution of War depends to a marked degree upon the availability of equipment and supplies, in good useable condition, at the time and place, and in the quantity wanted. The failure of a shipping container to deliver its contents in useable condition means not only the loss of those contents to the user, but lost effort in manufacture, transportation, warehousing, handling, in fact, all elements that have contributed to its arrival at the specified place.

At the time a procurement order is placed, it cannot be foretold, in detail, just what hazards a package will undergo. But we can be reasonably sure that the hazards will be many and real. Prior to 1942, little constructive thought had apparently been given the problem. Repeated "loss in transit" reports produced action resulting in marvelous examples of the finest packaging and packing by the latter years of the War. The cost of doing the job right is admitted to be considerable. But this cost is in fact a minor fraction of the dollar cost in doing it wrong, leaving out of consideration other intangible but important costs such as time, handling in active theaters, etc.

Packages will break. Every time a package is picked, it must be set down--or dropped. Handling in a sling from hold of ship to pier or lighter invariably damages packages. Stevedores, military or civilian, seldom handle packages as the commander desires. Some breakage is done willfully. Cargo eventually reaches the depot or supply point overseas, always with some items damaged. And here of course it is directed that broken packages go to the "broken package room," for security and repackaging. But there are no such rooms in open storage depots. What too frequently happens is

that the broken packages remain in ordinary stacks with the rest of the stock. Such ready availability of supplies becomes a constant, minute-by-minute temptation to depot personnel to pilfer. Or perhaps the real word is steal, as such situations with alarming frequency lead to organized removal of stocks to outside disposal. Goods in such broken packages are likewise less protected from the elements. And leakage of flour, sugar, beans, etc., onto the floors leads to complete loss. Leakage of liquids thru stacked canned goods spreads corrosion.

The answer to all this is organized effort by the commander to repackage every such item. This again is easy to order, difficult to effect to the degree required, but must be achieved if supplies are to be protected.

What has been said for QM Class I applies with substantially equal force to all consumer items. And the cure is the same in each case.

These experiences lead to recommendations for improvement in packing at the source in the Zone of the Interior, as much of the rough-handling in active theaters is inescapable.

There are two thoughts possibly worth giving: First, the fullest support by all concerned of the Armed Forces Research and Development and Standardization program in packaging and packing, as it potentially has unprecedented dividends. This will help insure that the packaging and packing are done right the first time, - at point of manufacture. Second, at every significant point where packaged goods come to rest in their movement from factory to battle, such as Holding & Reconsignment Points, Warehouses, and Supply Points, install a recrating or recooperage section that really works. Tremendous losses will thus be minimized, not the least of which is pilferage. This idea is very easy to suggest, surprisingly difficult to implement adequately or in anything like a realistic fashion. Losses from improper packing are so staggering as to defy belief. I quote from a lecture delivered at this college earlier this year: "We had figured, in the Service I was in, that in the beginning we were only losing about 35% of our stuff, not bad. It is a lot, though. When it came to redeployment, moving that material from one theater to another, I figured we would lose approximately 55 or 60 percent. But I was wrong. We lost about 99 percent of it, simply because there had not been adequate planning." I present this direct quotation as given. If the losses actually incurred are anything like the percentages given, we of the Armed Services face a problem, the proper solution of which will save literally billions of dollars.

I have discussed, only in limited degree, a very few of the problems which are the very life of the logistic support of combat. Marking, warehousing, classifying, handling, and documentation are a few of the others

which directly effect distribution, and in turn, procurement. To accomplish a desired result in any of these specific fields of endeavor requires a high price - and that price is the know-how, with eternal, everlasting vigilance in supervision to make things really go correctly and gain the end product - the pay-off.

I am sure you gentlemen have heard nothing which appeals to you as "new." To use a British term, this presentation has been very "low-level." But the entire job of logistic support of combat is the summation of a million little things, any one of which, if it goes correctly, is only to be expected -- but if it goes wrong, it upsets or frustrates a train of events and wrecks the procedure, causing such delays or losses as eventually lead to your major crises in this supply business. I repeat, the price of success is unremitting attention to every single detail.

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