

during the fall and early winter. Nevertheless, reserves were generally exhausted, and operations of the Luftwaffe and Wehrmacht were controlled more and more by production and less and less by military necessity. Germany was cracking up. In February the Russians captured the synthetic plants in Silesia. The Ruhr was captured. Production skidded to 18 1/2 percent in March, and to an incredible 7 1/2 percent in April.

German Rail system Impaired Transportation targets are unlike others in that they are both tactical and strategic in nature. Our campaign against the enemy communications system was primarily tactical, but as a by-product we derived enormous strategic gain from it. This is because only about 25 per cent of the system's capacity was employed to carry military freight, whereas at least 50 per cent was used in the war economy. This means that any reduction in capacity had twice the impact on industrial as on military operations. As a matter of fact military freight usually carried a top priority, which had the effect of putting almost all the strain of reduced capacity directly on industry.

In addition consider the following peculiarities, all weaknesses, of any rail system: It is a fundamental industry being essential to all components of the civilian and war economies. It cannot be moved or dispersed. It is so large that it cannot be well defended. It is almost impossible to camouflage effectively. It cannot go underground. Targets are so numerous that there is almost always some part of the system which is not cloud obscured despite general overcast weather. They are also so varied that they can be attacked by all kinds of aircraft. Heavy attacks within a certain area can be compensated for in part by shifting to road or water transport, but lost capacity cannot be balanced by expansion somewhere else, as is the case in manufacturing. Finally, the effects of air attack are cumulative because the capital investment is exceptionally high and damage cannot be replaced at a rate comparable to the potential rate of new damage. As a result, policing costs are low and enemy recuperation is slow.

Balance these factors against the over all size, flexibility and initial excess capacity of the enemy system, and you have the problem. It was solved by the 8th, 9th and RAF which dropped 400,000 tons on rails in the year March 1944 to April 1945.

Not only did it require tremendous expenditures to mount the strategic bombardment campaign, but it was also necessary to overcome numerous operational difficulties peculiar to the European and Mediterranean theaters. One report aptly sums up the case. As usual we can start out by stating that unsuitable weather limited air operations.

Maintenance of heavy bombers in Europe encountered the following main weather problems: mud, rain, frost, low temperatures in flight and icing. Thanks to the excellent lend-lease constructed airdromes in England, mud did not present such a problem as it did in Italy. There, during frequent rainy spells, planes bogged down whenever they happened to leave reinforced surfaces. It likewise was impossible to prevent battle-damaged planes from overshooting runways onto soft ground. Another disrupting factor was mud being tracked into aircraft by crew members, which sometimes worked down

into cable pulleys, fairleads, guides, electrical terminals, or connectors causing failures of equipment. It was a particular nuisance in maintenance of escort fighters, where it collected in landing gear, blotted out gun cameras and in general made conditions hell to work in. Precipitation in the form of rain or snow had slight effect on air operations, but it frequently made ground crew activities well nigh impossible. Frost during winter was also troublesome, because, as any skier knows, planes are unsafe to fly until it is eliminated. This problem was satisfactorily solved by application of a special liquid which melts frost and retards further accumulation. Low flight temperatures had their greatest effect on personnel, notably waist and tail gunners who were often exposed to temperatures of 55° below over Germany in winter. Icing was a particular deterrent to operations.

At one point in January of this year the 15th AF was grounded ten consecutive days because of icing conditions either at base or enroute to targets. Included in the figure of over 9,000 heavy bombers lost in ETO and MTO are 1,097 destroyed for reasons 'other than combat.' A great number of these can be attributed to adverse weather.

Difficult as were heavy bomber missions during spells of bad weather it was even tougher for the escort fighter. In the first place, instrument flying depends largely on the airplane simulating a steady platform. The larger the plane, the less effect turbulence has on it. A pursuit not only is light, but it also has highly sensitive controls to permit greater maneuverability in combat. Rough air or slight errors in flying technique, virtually unnoticeable in a Fortress, are exaggerated in a fighter, may cause it to assume dangerous attitudes. Perfect trim, so important in good instrument flying, is also hard to achieve in a single engined plane because of torque.

Nevertheless, frequently the "little friends" went out on escort duty when the ceiling was only 600 feet and visibility a mile and a half. Cloud layers sometimes piled up to 22,000 feet, despite this, missions were scheduled and carried out. Instead of having a method of assembly on homing beacons, fighters formed their flights of four below the overcast and as soon as they were assembled. The leader would start a straight away climb up into the soup. The three wing men would nestle close like a flock of ducks and concentrate entirely on flying tight formation while the leader did the instrument flying. Not infrequently visibility became so bad that unless they virtually overlapped wings, they would lose sight of their flight commander. Thus one man had to take responsibility for three others, but our pilots were entirely up to the job. Unfortunately, on some occasions inexperienced wing men, flying their first combat missions, would become confused after long, tiring stretches of weather flying. It wasn't difficult to think that the flight leader was turning when he really wasn't. Thus, the wing man sometimes would start to turn, find himself in a cockeyed attitude, get vertigo, lose his position and reference on his lead and finally go into a spin. Several pilots were lost in this fashion. On some occasions planes got back to their home bases, only to find them socked in by the impenetrable English ground fog.

It was still possible to get them down safely by routing them to airdromes equipped with the ingenious British FIDO a method, which employed gasoline burners along the runways. These warmed the air

