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**Unit 3: Systems**

Lesson 3: Reverse Engineering

**File 3.3.1: Soviets Copy B-29 Bomber During WWII**

During World War II, at least three American B-29 bombers landed in Russia. Any U.S. aircrafts that landed in Russia during that time were retained by the Soviets.

The Soviets had a need for heavy bombers. The American B-29s were heavy bombers that were very advanced, technologically. The Soviets “examined the B-29s in minute detail and copied them almost exactly (a fairly remarkable engineering feat)” (National Museum of the U.S. Air Force, 2006). The Soviet heavy bomber was called the TU-4 (a.k.a., BULL).

Soviet engineers were ordered by Joseph Stalin, the leader of the Soviet Union, to copy the American B-29 exactly. This project was designated as being of the utmost urgency and priority. Stalin had a reputation for a “well-known propensity to brutally punish failure” (Steeljawscribe, 2007). Accordingly, engineers took the order to produce an exact copy very seriously. Failure to follow those orders could result in imprisonment.

To that end, even errors, repairs, and minutiae in design were copied.

* A hole on the wing of the airplane that seemed to have no purpose was copied. It has been speculated that the hole in the American B-29 was drilled in error and was never filled because it was so small (Steeljawscribe, 2007).
* The engines and props in the American B-29 had design flaws that included a possibility of catching fire, which were not corrected in the TU-4 (Steeljawscribe, 2007).
* The TU-4 incorporated “a repair patch [that] was duplicated from the original B-29” (Air Force Museum, 2011).
* The “exact hue of the interior paint scheme” was copied.

There were some differences in design with the TU-4, which were carefully selected by engineers as being of primary importance. These include modifications for Soviet guns and the thickness of the aluminum skin.

The TU-4s, copied largely from the American B-29 bombers, had great impact on Soviet aviation capabilities. They were in use as early as 1947. “By 1954, TU-4s were beginning to be removed from military service” (Air Force Museum, 2011). The far-reaching impact of this engineering feat is evident when one considers that it was eventually “converted to a 70-passenger airliner” (Steeljawscribe, 2007).

Air Force Museum. (2011). *Tu-4 “Bull*.” Retrieved from <http://www.moninoaviation.com/40a.html>.

National Museum of the U.S. Airforce. (2006). *Soviet Union impounds and copies B-29*. Retrieved from <http://www.nationalmuseum.af.mil/factsheets/factsheet.asp?id=1852>

Steeljawscribe. (2007). *Red bulls: Of replication, the B-29 and TU-4 Bull*. Retrieved from <http://steeljawscribe.com/2007/04/30/red-bulls-of-replication-the-b-29-and-tu-4-bull>.

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