

## KONZERVIRANJE I RESTAURIRANJE DŽEPNE PODMORNICE CB-20

### The Conservation and Restoration of the CB-20 Midget Submarine

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#### **Sažetak**

*Tema je konzerviranje i restauriranje džepne podmornice CB No. 20 (CB-20) koju je proizveo talijanski proizvođač Caproni u ožujku 1944. godine. Podmornica CB-20 zadnja je cjelovita podmornica iz cijele serije od ukupno 26 proizvedenih u Drugome svjetskom ratu.*

*Zbog progresivne korozije i degradacije materijala, podmornica CB-20 rastavljena je do stupnja do kojega je to bilo moguće, kako u unutarnjem tako i vanjskom segmentu, pri čemu je uz pomoć stručnjaka s Fakulteta strojarstva i brodogradnje Sveučilišta u Zagrebu napravljena analiza zatečenog stanja i korištenih materijala. Za vrijeme analize utvrđene su preinake nastale tijekom korištenja u Jugoslavenskoj mornarici, koje su uklonjene, a uz to su izrađeni i dijelovi koji su nedostajali kako bi podmornica nakon konzerviranja i restauriranja bila sklopljena u izvornu cjelinu.*

*Uz navedene poslove konzerviranja i restauriranja obavljani su poslovi rastavljanja, čišćenja te ponovnog spajanja u cjelinu i sve to u zgradi Tehničkog muzeja u odjelu Prometnih sredstava. Radovi su detaljno dokumentirani u svim fazama i trajali su, uzevši u obzir i razdoblje izrade plana obnove, od 2007. do kraja 2009. godine.*

*Podmornica je prilagođena muzejskim posjetiteljima za razgledavanje vanjske strane objekta (uklanjanjem starih nosača i podizanjem 40 tona teške podmornice za otprilike 80 cm). Kao što je vanjski dio podmornice prilagođen razgledavanju, tako je i unutrašnjost, uz pomoć mosta, prilagođena posjetu.*

**Ključne riječi:** konzerviranje, restauriranje, džepna podmornica, posljednji primjerak

### *Summary*

*The topic of this paper is the conservation and restoration of the midget submarine "CB No.20" ("CB-20"), constructed by the Italian manufacturer "Caproni" in March 1944. The "CB-20" is the last preserved submarine of an entire class, i.e. of a total of 26 submarines produced during World War II.*

*Due to the progressive material corrosion and degradation, the interior and the exterior of the "CB-20" had to be dismantled to the greatest extent possible. Experts from the Faculty of Mechanical Engineering and Naval Architecture of the University of Zagreb helped analyse the state of the submarine and the materials used. The analysis identified some changes which had been introduced during its service in the Yugoslav Navy, which were then reversed. Missing parts were constructed so that the submarine could be assembled back to its original state after conservation and restoration.*

*The aforementioned conservation and restoration activities were supplemented by disassembling, cleaning and reassembling activities completed in the premises of the Technical Museum, Department of Means of Transportation. Every stage of activity was recorded in detail. The work was carried out between 2007 and the end of 2009, including the time spent on drawing up the restoration design.*

*Now not only can visitors of the museum view the exterior of the submarine (the old supports were removed and the 40-ton submarine was elevated by approximately 80 cm), they can also visit its interior by means of a bridge.*

**Key words:** *conservation, restoration, midget submarine, last exhibit*