

# „Petroleum Production Engineering”

## author M. Čikeš

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Book review



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The book „Petroleum Production Engineering“ (see **Figure 1**) written by Marin Čikeš, Ph. D., a retired Full Professor of the Faculty of Mining, Geology and Petroleum Engineering of the University of Zagreb was published in the year 2015, as a university textbook (*Manualia universitatis studiorum Zagrabiensis*). The publisher is the Faculty of Mining, Geology and Petroleum Engineering (RGN faculty), the University of Zagreb, and an edition of 500 copies was financially supported by INA - Oil industry, d. d. and the Croatian section of the Society of Petroleum Engineers (SPE). It is the author's second textbook, while the first entitled, „The Technology of Oil Production using Downhole Pumps” was published in 2006, co-authored by academic Mirko Zelić.

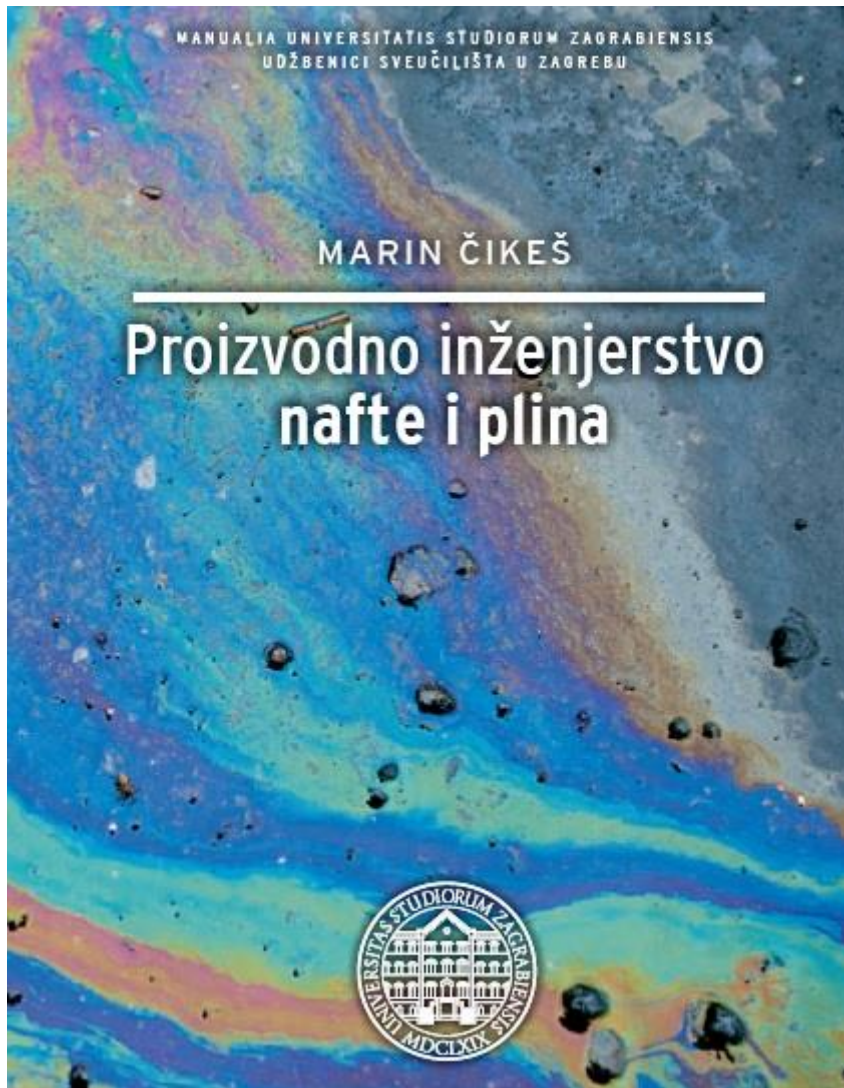
The textbook covers the field of petroleum production. It is published in the B<sub>5</sub> format on 524 pages with a total of 167 colour pictures and 15 tables, containing extensive nomenclature, bibliography and an index. Petroleum production includes two distinct, but very connected systems: reservoir and well. The textbook describes the so-called natural flow production, where the reservoir energy (pressure) is enough to raise fluids from the bottom of the well to the surface, while the artificial methods such as downhole pumps are given in the previous book. Petroleum production engineering is a part of petroleum engineering, which seeks to maximize production in a cost effective way, so the textbook follows that definition and also relates to other areas of petroleum engineering, and all of that is covered in the book's five chapters.

In the first chapter, *The basic properties of oil and gas reservoirs*, these terms are described in detail: the thermodynamic properties of hydrocarbons, the physical properties of reservoir rocks and the physical properties of the reservoir fluid. In the second chapter, *The fluid flow in the oil and gas reservoirs*, mathematical models are derived for fluid flow in the reservoir, shown through the six sections. In the third chapter, entitled *The analysis of the fluid flow in the oil and gas reservoirs*, which contains five sections, the complete well testing analysis is included. In the fourth chapter, *The fluid flow in the well*, the fundamental laws of fluid flow are given through five sections. The fifth chapter, *The analysis of the oil and gas production system*, describes the method of NODAL analysis of the entire well production system, for the purpose of optimization of the individual system components.

The book is a valuable scientific work, developed during the years of the author's scientific and lecturing work in the Department of Petroleum Engineering at the RGN faculty, Zagreb. Its publication is an event of great significance to the students of undergraduate, graduate and doctoral studies of petroleum engineering, as well as to a wider scientific and professional public in the oil and gas business of the Republic of Croatia. The book is available for rent or purchase at special prices for students and others, in the library of the RGN faculty.

About the author:

**Marin Čikeš**, as a Full Professor of the Faculty of Mining, Geology and Petroleum Engineering of the University of Zagreb, was a member of the Department of Petroleum Engineering and a lecturer of several courses on all of the petroleum engineering studies: Production of oil and gas I and II, Well testing I and II, Well stimulation. Before that, he worked as much as a full thirty years in the oil companies, while at the same time publishing more than 30 papers in foreign journals and at international conferences. In addition to the two mentioned textbooks, in 2012, he also co-authored a book published by the publishing house Springer, and all his published papers are available in his bibliography on the website <http://bib.irb.hr/lista-radova?autor=197740>.



**Figure 1:** Cover of the book „Petroleum Production Engineering” author M. Čikeš

**Slika 1:** Korice knjige „Proizvodno inženjerstvo nafte i plina” autora M. Čikeša

## „Proizvodno inženjerstvo nafte i plina” autora M. Čikeša

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Prikaz knjige



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Knjiga „Proizvodno inženjerstvo nafte i plina” (**slika 1**) autora prof. dr. sc. Marina Čikeša, redovitoga profesora u miru Rudarsko-geološko-naftnoga fakulteta Sveučilišta u Zagrebu, tiskana je 2015. godine kao sveučilišni udžbenik (*Manualia universitatis studiorum Zagrabensis*). Nakladnik je Rudarsko-geološko-naftni fakultet Sveučilišta u Zagrebu, a izdanje od 500 primjeraka financijski su potpomogli INA – Industrija nafte d.d. i Hrvatski ogranak Udruge naftnih inženjera SPE (Society of Petroleum Engineers). To je drugi autorov sveučilišni udžbenik, dok je prvi pod naslovom „Tehnologija proizvodnje nafte dubinskim crpkama” objavljen 2006. godine u suautorstvu s akademikom Mirkom Zelićem.

Udžbenik je iz područja proizvodnje nafte i plina, a tiskan je u B<sub>5</sub> formatu na 524 stranice s ukupno 167 slika u boji i 15 tablica te sadržava opsežnu nomenklaturu, bibliografiju i indeks. Proizvodnja nafte i plina obuhvaća dva različita, ali vrlo povezana sustava: ležište i bušotinu. U udžbeniku je prikazan tzv. eruptivni način proizvodnje, koji iskorištava prirodnu ležišnu energiju (tlak) za podizanje kapljevine s dna bušotine na površinu, jer su metode umjetnoga podizanja kapljevine dubinskim crpkama obrađene u prethodnome udžbeniku. Proizvodno inženjerstvo nafte i plina dio je naftnoga inženjerstva koje nastoji maksimalizirati proizvodnju na isplativ način, pa je udžbenik prema toj definiciji i prema povezanosti s ostalim područjima naftnoga inženjerstva podijeljen u pet poglavlja.

U prvome poglavlju, *Osnovna svojstva ležišta nafte i plina*, detaljno su opisana termodinamička svojstva ugljikovodika, fizička svojstva ležišnih stijena i fizička svojstva ležišnih fluida. U drugome poglavlju, *Protjecanje fluida u ležištima nafte i plina*, izvedeni su matematički modeli protjecanja fluida u ležištu, prikazani kroz šest potpoglavlja. U trećemu poglavlju obuhvaćena je cjelovita analiza hidrodinamičkih mjerenja u bušotinama, pod naslovom *Analiza protjecanja fluida u ležištima nafte i plina*, koja sadržava pet potpoglavlja. U četvrtome poglavlju, *Protjecanje fluida u bušotini*, dani su temeljni zakoni protjecanja fluida, podijeljeni u pet potpoglavlja. Peto poglavlje, *Analiza sustava proizvodnje nafte i plina*, opisuje metodu tzv. čvorišne analize (NODAL analizu) cjelokupnoga proizvodnog sustava bušotine, u svrhu optimalizacije pojedinih komponenti sustava.

Knjiga je vrijedno djelo, nastalo tijekom višegodišnjega autorova znanstveno-nastavnog rada u Zavodu za naftno inženjerstvo RGN fakulteta. Njezino objavljivanje koristit će studentima preddiplomskoga, diplomskih i doktorskoga studija naftnoga rudarstva te široj znanstvenoj i stručnoj javnosti u naftnome i plinskome gospodarstvu RH. Knjigu se može posuditi ili nabaviti po posebnim cijenama za studente i ostale u knjižnici RGN fakulteta.

O autoru:

**Marin Čikeš** kao redoviti profesor Rudarsko-geološko-naftnoga fakulteta Sveučilišta u Zagrebu bio je član Zavoda za naftno inženjerstvo i nositelj nekoliko kolegija na svim studijima naftnoga rudarstva: Proizvodnja nafte i plina I i II, Ispitivanja u bušotinama, Analiza hidrodinamičkih mjerenja i Obrada stijena u bušotinama. Prije toga radio je punih trideset godina u naftnome gospodarstvu te je uz svoj stručni posao objavio više od trideset radova u inozemnim časopisima i na međunarodnim konferencijama. Osim dvaju navedenih udžbenika, 2012. godine objavio je i knjigu u suautorstvu za izdavačku kuću Springer, a svi objavljeni radovi dostupni su u Hrvatskoj znanstvenoj bibliografiji na mrežnoj stranici <http://bib.irb.hr/lista-radova?autor=197740>.

