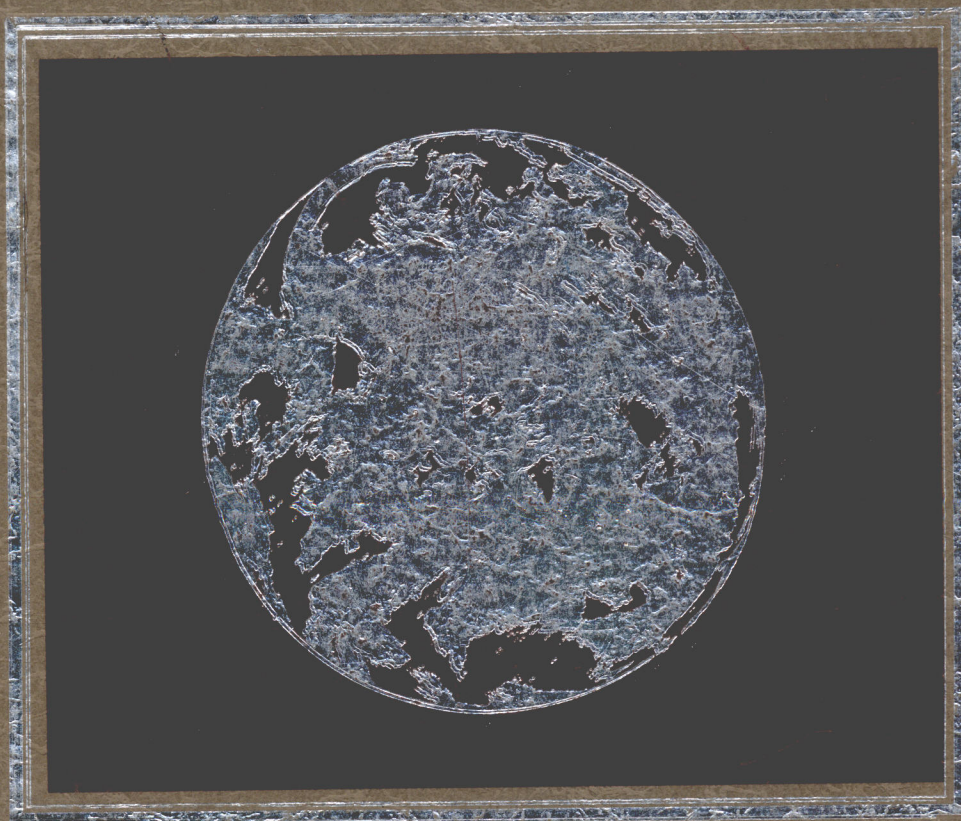


中国典型石油测井解释图集

阎敦实 主编



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INTERPRETATION ATLAS OF CHINA
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序 言

由于中国地处欧亚大陆东部，这一地区的大地构造发展演化史和沉积演化史极为复杂，导致中国含油气盆地中油气藏类型，油气储层也丰富多采，复杂多样。

地球物理测井队伍是我国石油工业界的高科技生力军之一。在极其困难的石油地质条件下，广大测井战线的专家和工人，为发现油气，建立储量，有效地开发油气田付出了艰辛的劳动，创下了光辉的业绩。

我国地球物理测井界，一方面，自力更生、大力发展各类生产急需的下井探测仪器和地面记录系统；另一方面，积极学习和引进国外先进的测井装备和技术，解决了大量疑难问题，积累了丰富的经验，在许多方面已赶上国外的先进水平。同时，我国测井界也面临着许多新的难题和挑战。

为便于在我国不同石油地质条件下工作的测井专家、勘探开发地质家、石油工程师和油藏工程师们交流经验，互相学习，提高水平，中国石油天然气总公司组织了一批有经验的测井专家，收集、整理、总结了我国不同类型盆地，不同类型油气藏，不同类型储层条件下，利用测井信息和综合其他信息，正确识别井下油气层，确定油气储量计算参数，以及在注水开发条件下确定剩余油饱和度等方面的方法和经验。对近十多年来国内发展、研制和国外引进的新测井装备及解释软件，在实际应用中有代表性效果的实例，也进行了收集和总结。

当前，我国石油工业中，正在大力发展和推行含油气盆地和油气藏的石油地质三维描述，特别是对已开发油气田中油气藏储层地质及开发动态的三维描述，测井专家们，即将结束“孤军作战，一孔之见”的历史，和勘探地质家、开发地质家、油藏工程师、地球物理家们一起，共同进入一个多专业、多学科协同工作，在三维空间更准确更精细更有效地发现油气田，认识油气田，开发好油气田的新时代。这一新的变化，将会进一步提高测井技术在油气勘探开发全过程的重要性，提高测井信息利用的广泛性，推动测井技术的进步。特别是在检测储层不均质、剩余油饱和度、复杂储层、水平井、小井眼井方面和现代地震信息的相互定量标定方面要有大的发展。

测井界这一高质量、高水平技术文献的出版问世，将大大丰富勘探开发生产一线工作的地质、物探、石油工程专家和管理人员的知识，提高协同工作的水平。对石油勘探开发科学研究部门和石油大专院校和专业技术学校，也将是重要的参考文献。

中国石油天然气总公司总地质师

阎秉实

1993年9月14日

PREFACE

As China is located in the east part of Eurasian continent, its tectonic and sedimentary evolution are very complicated, thereby resulting in various types of oil and gas reservoir and formations.

As one of the high-tech teams of china's oil industry, the geophysical well-logging crews, including experts and workers, worked very hard and made splendid achievements in oil and gas exploration, reserve evaluation and oil field development under very difficult geological condition.

On the one hand, China's geophysical well-logging industry developed by itself downhole tools and surface recording systems urgently needed for oil field operation; on the other hand, A lot of efforts were made to learn and import high techniques and advanced equipment from abroad, many difficult problems resolved, abundant experiences accumulated and , in some area, advanced level in the world reached. At the same time, numerous new questions and challenges are being faced.

In order that well-logging experts, exploration and development geologists, petroleum engineers and oil reservoir engineers can exchange their experience, learn from each other and upgrade their technical level, China National Petroleum Corporation organized a group of experienced well-logging experts to collect, organize and summarize their methods and experience in recognizing oil and gas formations, determining oil and gas formation reserve calculating parameters, and residual oil saturation in water-flooding wells by means of well-logging and other comprehensive information. The new well-logging equipment and softwares developed by ourselves and imported from abroad and some typical cases were also investigated and summarized.

At current time, the Chinese oil industry is developing and promoting petro-geological 3-D description, especially for reservoir geology and production performance of the developed oil and gas fields. The history of "working alone and viewing from one aspect" will end soon, and well-logging experts, together with exploration geologists, production geologists, reservoir engineers and geophysists, will enter a new era when experts with different profession and different knowledge work together to discover new oil and gas fields with higher accuracy, sophistication and efficiency. This new change will further increase the importance of well-logging techniques in oil and gas exploration and development, expand the utilization of well-logging data, and promote the progress of well-logging techniques. Especially, a big improvement will be made in logging of reservoir heterogeneity, residue oil saturation, complicated reservoir, horizontal well, slim well as well as in quantitative calibration of modern seismic information.

The publishing of this high-quality and high-level book regarding china's well-logging industry will enrich greatly the knowledge of geological, geophysical, and petroleum engineering experts and managerial personnel working in the frontier of oil exploration and development and will also promote the cooperation between them. This publication is also an important reference book for petroleum exploration and research organizations, petroleum colleges and technical schools.

Yan Dunshi

Chief Geologist, China National Petroleum Corporation September 14, 1993

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一、勘探阶段测井解释