ASSESSMENT OF STEAM SUPPLY FOR THE EXPANSION OF GENERATION CAPACITY FROM 140 TO 200 MW,KAMOJANG GEOTHERMAL FIELD, WEST JAVA, INDONESIA

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ABSTRACT

The Kamojang geothermal field has an installed generation capacity of 140 MW and another 60 MW is planned to be added. This paper presents an assessment of the feasibility of this expansion from the point of view of resource supply.

Volumetric assessment of reserves indicates an equivalent of at least 210 to 280 MW generation for 30 years, sufficient for the existing capacity plus the proposed expansion. The non-condensable gas content in the steam is low (<1%) with a modest amount of H_2S (<300 parts per million by weight). Silica scaling in flow lines and the turbines is being effectively handled and only one well produces corrosive steam. Therefore, the fluid chemistry presents no barriers to capacity expansion.

To date, 68 wells have been drilled with a high success rate (about 80%). Thirty-one wells (including 3 stand-by) are presently used to supply the existing plant, and more than sufficient wellhead steam capacity is available from the remaining wells for the expansion. Ample drilling sites are available for future make-up wells. The productivity of individual wells has declined at a very low rate (1 to 5% per year). Over the 15-year production history of the field, reservoir pressure has shown a modest drop (5 bars), implying that the reservoir storage and flow capacities are adequate for at least the existing generation level.

The produced steam has not shown any significant superheating to date; this fact and the relatively small pressure drop imply that the reservoir still contains water saturation. The present average well productivity decline rate is about 4.2% and we have estimated that the capacity expansion will change this to approximately 6.4%, which is still a low decline rate. This rate of decline implies the need for 2 to 3 make-up wells per year following capacity expansion. At this rate of make-up well drilling, the well-spacing will be reduced over 30 years to 350 m which should not cause undue interference between wells. Therefore, we have concluded that the planned expansion of generation at Kamojang is entirely feasible from the point of view of response supply.

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