

Efek Crosswind Berdasarkan Sudut Serang Terhadap Kereta Cepat di Stasiun Halim Perdana Kusuma = Crosswind Effect Respected To Yaw Angle On High-Speed Train At Halim Perdana Kusuma High-Speed Rail Project Station

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Abstrak

Kereta api cepat menjadi salah satu transportasi yang mendapat perhatian khusus dalam riset dan penelitian nasional. Hal tersebut terjadi karena akan dibangunnya kereta api cepat dari Jakarta ke Bandung dengan harapan untuk mempercepat perkembangan kedua daerah tersebut dan daerah-daerah diantaranya. Dalam pengoperasiannya kereta api cepat seringkali mendapatkan masalah apabila terkena efek dari angin crosswind. Daerah Jakarta-Bandung merupakan daerah yang memiliki ketinggian berbeda dimana daerah Bandung memiliki daerah lebih tinggi dibanding Jakarta sehingga terdapat crosswind. Skripsi ini bertujuan untuk menganalisa efek dari crosswind dari beberapa sudut serang terhadap performa aerodinamika kereta yang melintasi jalur proyek kereta cepat Jakarta-Bandung. Dari riset ini, telah didapatkan data berupa drag coefficient, lift coefficient, rolling moment coefficient, yawing moment coefficient, pitching moment coefficient, side force, drag force and lift force. Telah didapati bahwa sudut serang dari angin crosswind berpengaruh pada performa aerodinamika pada kereta cepat dan perbedaan temperature lingkungan tidak berpengaruh secara signifikan pada performa aerodinamika dari kereta cepat. Dari riset ini juga ditemukan bahwa pada saat sudut serang lebih besar dari 20 derajat maka nilai dari drag coefficient akan turun, sesuai dengan tren pada penelitian dari (Howell, 2015; Ishak et al., 2019).

.....The high-speed train becomes one of transportation that got attention from national research and development projects. Furthermore, it is becoming a priority research due to the Jakarta-Bandung high-speed railway project, which is done to develop and speed up the development between both regions. Based on several pieces of kinds of literature, on its operation high-speed train is commonly having an accident caused by the crosswind effect. Furthermore, Jakarta and Bandung have different magnitudes which Bandung is higher than Jakarta, therefore there are crosswinds in those areas. This undergraduate thesis will analyze the effect of crosswind respected to its yaw angle on the aerodynamic performance of the high-speed train on the Jakarta-Bandung Railway Project. From the research, the researcher has gained the data in the form of drag coefficient, lift coefficient, rolling moment coefficient, yawing moment coefficient, pitching moment coefficient, side force, drag force and lift force. Furthermore, the researcher has found that crosswind with yaw angle is affecting the high-speed train aerodynamics performance, and also the temperature of the air does not affect the aerodynamics component of the train. It also has been found that the trend of drag coefficient value tends to decrease when the crosswind yaw angle is larger than 20°, similar to other research trends (Howell, 2015; Ishak et al., 2019), the drag which is happened to the train is induced drag which lifts also playing its component on it.