SUBNORMALITY FROM BOUNDED VECTORS

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For a densely defined operator $S$ in a Hilbert space $\mathcal{H}$ having invariant domain, that is, $SD(S) \subset D(S)$, consider the following positive definiteness condition:

$$\sum_{i,j=0}^{p} \langle S^i f_j, S^j f_i \rangle \geq 0, \quad f_0, \ldots, f_p \in D(S).$$

(1)

Moreover, for a densely defined operator $A$ in $\mathcal{H}$, $f \in \cap_{n=1}^{\infty} D(A^n)$ is said to be a bounded vector if

$$\|A^n f\| \leq ab^n, \quad n \in \mathbb{N},$$

with $a$ and $b$ depending on $f$.

QUESTION. Is $S$ subnormal if it satisfies (1) and the set of bounded vectors of $S^*$ is dense?

References